(1)

No. 22-105-ORG
Status: GRANTED

Title: State of Kansas, Plaintiff
v.
State of Colorado

Docketed:
December 16, 1985

Counsel for petitioner: Littleworth,Arthur A.

Entry	Date	Note	Proceedings and Orders
1	Dec 16 1985	P	Motion for leave to file and bill of complaint filed.
2	Dec 16 1985		Motion for leave to file a Bill of Complaint.
3	Feb 14 1986		Colorado's Brief in opposition to Motion for Leave to file Complaint filed.
4	Feb 19 1986		DISTRIBUTED. March 7, 1986 (Motion for leave to file Bill of Complaint filed).
5	Mar 3 1986		Motion for injunctive relief or an order to compel defendant to comply with Arkansas River Compact.
6	Mar 3 1986		Reply brief filed by plaintiff. (Also brief in support of above motion).
7	Mar 5 1986		DISTRIBUTED. March 21, 1986.
8	Mar 13 1986		Opposition filed by Colorado.
9	Mar 18 1986		Reply brief filed by Kansas.
10	Mar 24 1986		The motion for leave to file a Bill of Complaint is GRANTED. Defendant is allowed 60 days within which to file an answer.
11	May 22 1986		Answer to complaint, counterclaim, and motion for appointment of Special Master received.
12	May 27 1986		DISTRIBUTED. June 12, 1986.
13	Jun 11 1986		Kansas's reply to counterclaim filed.
14	Jun 13 1986		REDISTRIBUTED. June 19, 1986. (Answer to complaint, counterclaim and motion for appointment of Special Master.
15	Jul 7 1986		Ordered that the Hon. Wade H. McCree, Jr., of Ann Arbor, Michigan, is appointed as Special Master.
16	Jul 21 1986		Oath of Special Master received.
17	Oct 19 1987		It is ordered that Arthur L. Littleworth, Esquire, of Riverside, California, be appointed Special Master in place of Hon. Wade H. McCree, Jr., deceased. The Special Master shall have the authority to fix the time and conditions for the filing of additional pleadings and authority to summon witnesses, issue subpoenas, and take such evidence as may be introduced and such as he may deem it necessary to call for. The Special Master is directed to submit such reports as he may deem appropriate. The compensation paid to his legal, technical, stenographic, and clerical assistants, the cost of printing his report, and all other proper expenses,including travel expenses, shall be charged against and be borne by the parties in such proportion as the court may hereafter direct.
18	Nov 2 1987		Oath of the Special Master
19	Feb 29 1988		Joint motion for approval of expenses filed. (NP).
20	Feb 29 1988		DISTRIBUTED. March 4, 1988. (Joint motion for approval of expenses).

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Entry	Date	Note	Proceedings and Orders
21	Mar 7 1988		The joint motion for approval of expenses incurred by Special Master Wade H. McCree, Jr., deceased, is GRANTED and the allocation set forth in the motion is approved.
22	Nov 23 1988		Motion of Special Master for interim fees and expenses filed.
23	Nov 25 1988		Response to above motion filed by Kansas.
24	Nov 25 1988		Response to above motion filed by Colorado.
25	Nov 28 1988		DISTRIBUTED. Dec. 2, 1988. (Motion of Special Master for interim fees and expenses).
26	Dec 5 1988		The Motion of the Special Master for award of interim fees and expenses is GRANTED and the allocation set forth in the motion is approved. This amount is to be paid equally by the parties.
27	Jan 28 1989		Motion to refer to Special Master motion for leave to amend complaint is filed.
28	Feb 1 1989		DISTRIBUTED. Feb. 17, 1989. (Above Motion).
29	Feb 21 1989		The Motion to refer to the Special Master the Motion for leave to amend to complaint is GRANTED.
30	Nov 13 1989		Motion of Special Master for interim fees and expenses filed.
31	Nov 13 1989		First Amended Complaint filed.
32	Nov 15 1989		DISTRIBUTED. Dec. 1, 1989. (Motion of Special Master for interim fees and expenses and also First Amended Complaint).
33	Nov 25 1989		Consent thereto filed by Colorado. (D).
34	Dec 4 1989		The motion of the Special Master for award of interim fees and expenses is GRANTED and the Special Master is awarded a total of $83,082.76 to be paid by Kansas, Colorado and the United States pursuant to the allocation order filed by the Special Master on Oct. 9. 1989.
35	Dec 13 1989		Colorado's answer to the First Amended Complaint and Counterclaim filed.
36	Oct 12 1990		Motion of the Special Master for intrim fees and expenses filed.
37	Oct 15 1990		DISTRIBUTED. Oct. 26, 1990.
38	Oct 29 1990		The motion of the Special Master for interim fees and expenses is GRANTED and the Special Master is awarded $75,973.75 for the period November 1, 1989 through September16, 1990, to be paid by the parties as follows: 40% by Kansas, 40% by Colorado and 20% by the United States. Opinion by Justice Blackmun respecting award of fees and expenses.
39	Jun 27 1991		Motion of the Special Master for interim fees and expenses.
40	Jul 30 1991		Response by Colorado filed.
41	Aug 5 1991		Response by Kansas filed.
42	Nov 4 1991		Further information requested of the Special Master by the Court.
43	Dec 6 1991		Further information filed by Special Master
44	Jan 13 1992		Motion of the Special Master for Interim Fees and

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Entry	Date	Note	Proceedings and Orders
			Expenses is GRANTED and the Special Master is awarded $429.457.39 to be paid in accordance with the order of Oct. 9, 1989. Justice Thomas took no part in the consideration or decision of this case.
45	Jun 30 1992		Motion of the Special Master for Interim fees and expenses filed.
46	Oct 5 1992		The motion of the Special Master for award of interim fees and reimbursements of expenses is GRANTED and the Special Master is awarded a total of $244,063.47 to be paid as follows 40% by Kansas, 40% by Colorado and 20% by the United States.
47	Apr 19 1993		Motion of Special Master for award of compensation and expenses (period of June 22 - Feb. 28, 1993)
48	Apr 19 1993		DISTRIBUTED. April 23, 1993 (above motion)
49	Apr 26 1993		ORDER: The motion of the Special Master for award of interim fees and reimbursement of expenses for the period of June 22, 1992 through February 28, 1993 is GRANTED and the Special Master is awarded a total of $153,042.26 to be paid as follows: 40% by Kansas, 40% by Colorado and 20% by the United States.
50	Feb 22 1994		Motion of Special Master for Interim Fees and Expenses filed.
51	Mar 7 1994		ORDER: The motion of the Special Master for interim fees and reimbursement of expenses for the period March 1, 1993 through February 7, 1994 is granted and the Special Master is awarded a total of $202,934.15 to be paid as follows: 40% by Kansas, 40% by Colorado and 20% by the United States.
52	Jul 29 1994		Report of Special Master (3 volumes) and Appendix received.
55	Aug 3 1994		Report of Special Master distributed. September 26, 1994.
53	Aug 5 1994		Pleading index received (Special Master).
54	Aug 26 1994		Motion of Special Master for Interim Fees and Expenses filed. (NP)
56	Oct 3 1994		ORDER: The motion of the Special Master for interim fees and expenses is granted and the Special Master is awarded $92,240.78 to be paid a follows: 40% by Kansas, 40% by Colorado and 20% by the United States. The Report of the Special Master is received and ordered filed. Exceptions to the Report, with supporting briefs, may be filed by the partie within 45 days. Reply briefs, if any, may be filed by the parties within 30 days.
57	Nov 17 1994		Exceptions of Kansas filed.
58	Nov 17 1994		Exceptions of Colorado filed.
59	Nov 17 1994		Brief of Wyoming as amicus curiae filed.
60	Dec 14 1994		Time to file all replies to the exceptions to the Special Master extended to and including January 3, 1995 for all parties.
61	Dec 30 1994		Colorado's reply brief filed.
62	Jan 3 1995		Brief for the United States in response to the

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Entry	Date	Note	Proceedings and Orders
			exceptions of Kansas and Colorado filed.
63	Jan 3 1995		Kansas' reply opposing Colorado's Exceptions filed.
64	Jan 4 1995		DISTRIBUTED. (Jan. 20, 1995 Conf)
65	Jan 23 1995		ORDER: The Exceptions to the Report of the Special Master are set for oral argument in due course.
66	Jan 27 1995		Motion of United States for divided argument filed. (NP)
67	Jan 30 1995		SET FOR ARGURMENT TUESDAY, MARCH 21, 1995. (1ST CASE).
70	Jan 30 1995		Motion of Kansas for divided argument filed.
68	Feb 1 1995		CIRCULATED.
69	Feb 9 1995		Response of Kansas to motions of United States and Colorado for divided argument filed.
71	Feb 21 1995		ORDER: The motion of Kansas for divided argument is granted and the time is allotted as follows: Kansas - 30 minutes, Colorado - 20 minutes, the United States - 10 minutes. The motion of Colorado for divided argument is denied. The motion of the Solicitor General for divided argument is denied.
72	Mar 21 1995		ARGUED.

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-105

No. _____, Original

Supreme Court, U.S.
FILED
DEC 16 1985
JOSEPH F. SPANIOL, JR.
CLERK

IN THE

Supreme Court of the United States

October Term, 1985

STATE OF KANSAS,
Plaintiff,

v.

STATE OF COLORADO,
Defendant.

MOTION FOR LEAVE TO FILE COMPLAINT, COMPLAINT, AND BRIEF IN SUPPORT OF MOTION FOR LEAVE TO FILE COMPLAINT.

ROBERT T. STEPHAN
Attorney General of Kansas

JOHN W. CAMPBELL
Assistant Attorney General

RICHARD A. SIMMS
Special Assistant Attorney General
Counsel of Record

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December 16, 1985

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COMPLAINT

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BRIEF IN SUPPORT OF MOTION FOR LEAVE TO FILE COMPLAINT

CERTIFICATE OF SERVICE

No. _____, Original

IN THE

Supreme Court of the United States

October Term, 1985

STATE OF KANSAS,
Plaintiff,

v.

STATE OF COLORADO,
Defendant.

MOTION FOR LEAVE TO FILE COMPLAINT

Comes now the State of Kansas, by its Attorney General, the Honorable Robert T. Stephan, and hereby moves the Court for leave to file its complaint against the State of Colorado.

Respectfully submitted,

ROBERT T. STEPHAN
Attorney General of Kansas

JOHN W. CAMPBELL
Assistant Attorney General

RICHARD A. SIMMS
Special Assistant Attorney General
Counsel of Record

Hinkle, Cox, Eaton, Coffield & Hensley
218 Montezuma
Post Office Box 2068
Santa Fe, New Mexico 87504
(505) 982-4554

No. _____, Original

IN THE

Supreme Court of the United States

October Term, 1985

STATE OF KANSAS,
Plaintiff,

v.

STATE OF COLORADO,
Defendant.

COMPLAINT

The State of Kansas, by its Attorney General, the Honorable Robert T. Stephan, brings this suit against the Defendant, State of Colorado, and for its cause of action states:

1. The jurisdiction of the Court is invoked under Article III, Section 2, Clause 2 of the Constitution of the United States and Paragraph (a), Section 1251, Title 28 of the United States Code.

2. The Arkansas River is an interstate river which rises near Leadville, Colorado and flows south to Salida, Colorado, east through Canon City and Pueblo, and across southeastern Colorado into the State of Kansas.

3. In order to resolve existing and future controversies and to divide and equitably apportion the water of the Arkansas River, Congress consented to the negotiation of a compact by the states of Colorado and Kansas. Act of April 19, 1945, 59 Stat. 53. Subsequently, the Arkansas River Compact was ratified by the State of Colorado by the Act of February 19, 1949, Colo. Rev. Stat. 1963, § 149-9-1; the State of Kansas ratified the Compact by the Act of March 7, 1949, Kansas Gen. Stat. Ann. 1964, § 82a-520. The Compact was approved and enacted into federal law by the Act of Congress of May 31, 1949, 63 Stat. 145. A copy of the Arkansas River Compact is attached hereto as Appendix A and made a part hereof by reference.

4. The principal purpose of the Arkansas River Compact was to "(e)quitably divide and apportion . . . the waters of the Arkansas River and their utilization as well as the benefits arising from the construction, operation and maintenance by the United States of John Martin Reservoir Project for water conservation purposes." 63 Stat. 145, 145, art. I.

5. While expressly recognizing the possibility of offsetting postcompact development of the waters of the Arkansas River by new regulation or increased efficiency, the Compact mandates "that the waters of the Arkansas River, as defined in Article III, shall not be materially depleted in usable quantity or availability for use to the water users in Colorado and Kansas . . . by such future development or construction." 63 Stat. 145, 147, art. IV(D).

6. The Compact provides that "Colorado shall administer the decreed rights of water users in Colorado Water District 67 as against each other and as against all rights now or hereafter decreed to water users diverting upstream from John Martin Dam on the basis of relative priorities . . .." 63 Stat. 145, 148, art. V(F).

7. Through the actions of its officers, agents and political subdivisions, the State of Colorado and its water users have materially depleted the usable and available stateline flows of the Arkansas River since the adoption of the Compact.

8. In spite of its duties and obligations under the Compact, since 1949 the State of Colorado has allowed and permitted substantial increases in the diversion and use in Colorado of the surface and hydrologically related ground waters of the Arkansas River, without the concomitant regulatory or conservation measures that the Compact requires to protect the states against material depletions in usable stateline flows.

9. The lack of effective administrative practices in Colorado has encouraged rather than retarded the development of postcompact depletions of the waters of the Arkansas River Basin and has resulted in ongoing, material depletions of the usable flows of the Arkansas River and substantial and irreparable injury to Kansas water users.

10. For more than twenty years, the State of Colorado has investigated and known the impact of the ground water appropriations in the Arkansas River Basin in Colorado. Approximately 150,000 acre feet per year of ground water related to the Arkansas River has been appropriated in Colorado since 1949, and the State of Colorado has intentionally disregarded the findings of its investigations to the effect that such appropriations directly and materially reduce the usable flow and availability of the Arkansas River in Colorado

and Kansas. By its acquiescence in the postcompact proliferation of ground water diversions and its failure to administer the priorities of postcompact ground water diversions with existing surface diversions, Colorado has breached and continues to breach its obligations and responsibilities under the Arkansas River Compact.

11. Since the adoption of the Compact, the State of Colorado has attempted to unilaterally impede the bilateral action of the Compact Administration intended to protect Kansas' Compact apportionment and has failed to apply and administer its internal laws in order to meet its obligations under the Compact.

12. Pursuant to Article VIII(H), the Arkansas River Compact Administration has conducted an investigation of alleged Compact violations. The State of Colorado, however, through its Compact Commissioner, has rejected and continues to reject the State of Kansas' requests to investigate the impact on the Arkansas River of: 1) Colorado's substantial, postcompact ground water depletions of surface flows at the stateline; 2) the failure of Colorado to administer ground water priorities against surface priorities; 3) Colorado's artificially transferring water from the storage pool in Trinidad Reservoir to the sediment pool and then refilling the storage pool to the detriment of downstream users; 4) the consequences of future increases in the consumption of Colorado's transmountain return flows; and 5) Colorado's unilateral rejection of the Arkansas River Compact Administration's Resolution of July 24, 1951, requiring that any reregulaion of the native waters of the Arkansas River be approved by the Compact Administration. Additionally, the State of Colorado refuses to enjoin its postcompact ground water appropriations and resulting surface depletions during the pendency of investigation of the effects of such appropria-

tions, in spite of the irrefutable fact that those appropriations materially deplete the usable and available flows of the Arkansas River. Accordingly, the State of Colorado has used and will continue to use the pending administrative investigation as the basis for prolonging the substantial and irreparable injury to the State of Kansas by wrongfully depriving the State of Kansas and its citizens of the waters of the Arkansas River to which they are entitled under the Compact.

13. Grave and irreparable injury to the State of Kansas and its citizens who were entitled to receive and use the water apportioned to them by the Arkansas River Compact has been caused by the acts and conduct of the State of Colorado, its officers, citizens, and political subdivisions in failing neglecting, and refusing to deliver water to Kansas in the usable and available quantities apportioned to it by the Compact.

14. Grave and irreparable injury will be suffered in the future by the State of Kansas and its citizens unless relief is afforded by this Court to prevent the State of Colorado, its officers, citizens, and political subdivisions from using and withholding water which Kansas is entitled to and which Colorado has heretofore agreed to deliver pursuant to the terms and provisions of the Arkansas River Compact.

15. The State of Kansas has no effective remedy to enforce its rights under the Arkansas River Compact against the State of Colorado other than through the exercise of original jurisdiction in this case.

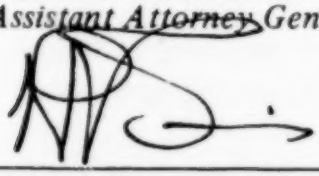
WHEREFORE, the State of Kansas respectfully prays that the Court issue its decree commanding the State of Colorado, its officers, citizens, and political subdivisions to deliver the waters of the Arkansas River in accordance with the provisions

of the Arkansas River Compact and providing for such other and further relief as the Court may deem appropriate.

Respectfully submitted,

ROBERT T. STEPHAN
Attorney General of Kansas

JOHN W. CAMPBELL
Assistant Attorney General



RICHARD A. SIMMS
Special Assistant Attorney General
Counsel of Record

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APPENDIX A

ARKANSAS RIVER COMPACT, 1948

The State of Colorado and the State of Kansas, parties signatory to this Compact (hereinafter referred to as "Colorado" and "Kansas", respectively, or individually as a "State", or collectively as the "States") having resolved to conclude a compact with respect to the waters of the Arkansas River, and being moved by considerations of interstate comity, having appointed commissioners as follows: "Henry C. Vidal, Gail L. Ireland, and Harry B. Mendenhall, for Colorado; and George S. Knapp, Edward F. Arn, William E. Leavitt, and Roland H. Tate, for Kansas"; and the consent of the Congress of the United States to negotiate and enter into an interstate compact not later than January 1, 1950, having been granted by Public Law 34, 79th Congress, 1st Session, and pursuant thereto the President having designated Hans Kramer as the representative of the United States, the said commissioners for Colorado and Kansas, after negotiations participated in by the representatives of the United States, have agreed as follows:

ARTICLE I

The major purposes of this Compact are to:

A. Settle existing disputes and remove causes of future controversy between the States of Colorado and Kansas, and between citizens of one and citizens of the other State, concerning the waters of the Arkansas River and their control, conservation and utilization for irrigation and other beneficial purposes.

B. Equitably divide and apportion between the States of Colorado and Kansas the waters of the Arkansas River and their utilization as well as the benefits arising from the construction, operation and maintenance by the United States of John Martin Reservoir Project for water conservation purposes.

ARTICLE II

The provisions of this Compact are based on (1) the physical and other conditions peculiar to the Arkansas River and its natural drainage basin, and the nature and location of irrigation and other developments and facilities in connection therewith; (2) the opinion of the United States Supreme Court entered December 6, 1943, in the case of *Colorado v. Kansas* (320 U.S. 383) concerning the relative rights of the respective States in and to the use of waters of the Arkansas River; and (3) the experience derived under various interim executive agreements between the two States apportioning the waters released from the John Martin Reservoir as operated by the Corps of Engineers.

ARTICLE III

As used in this Compact:

A. The word "Stateline" means the geographical boundary line between Colorado and Kansas.

B. The term "waters of the Arkansas River" means the waters originating in the natural drainage basin of the Arkansas River, including its tributaries, upstream from the Stateline, and excluding waters brought into the Arkansas River Basin from other river basins.

C. The term "Stateline flow" means the flow of waters of the Arkansas River as determined by gaging stations located at or near the Stateline. The flow as determined by such stations, whether located in Colorado or Kansas, shall be deemed to be the actual Stateline flow.

D. "John Martin Reservoir Project" is the official name of the facility formerly known as Caddoa Reservoir Project, authorized by the Flood Control Act of 1936, as amended, for construction, operation and maintenance by the War Department, Corps of Engineers, later designated as the Corps of

Engineers, Department of the Army, and herein referred to as the "Corps of Engineers". "John Martin Reservoir" is the water storage space created by "John Martin Dam".

E. The "flood control storage" is that portion of the total storage space in John Martin Reservoir allocated to flood control purposes.

F. The "conservation pool" is that portion of the total storage space in John Martin Reservoir lying below the flood control storage.

G. The "ditches of Colorado Water District 67" are those ditches and canals which divert water from the Arkansas River or its tributaries downstream from John Martin Dam for irrigation use in Colorado.

H. The term "river flow" means the sum of the flows of the Arkansas and the Purgatoire Rivers into John Martin Reservoir as determined by gaging stations appropriately located above said Reservoir.

I. The term "the Administration" means the Arkansas River Compact Administration established under Article VIII.

ARTICLE IV

Both States recognize that:

A. This Compact deals only with the waters of the Arkansas River as defined in Article III.

B. This Compact is not concerned with the rights, if any, of the State of New Mexico or its citizens in and to the use in New Mexico of waters of Trinchera Creek or other tributaries of the Purgatoire River, a tributary of the Arkansas River.

C. (1) John Martin Dam will be operated by the Corps of Engineers to store and release the waters of the Arkansas River in and from John Martin Reservoir for its authorized purposes.

(2) The bottom of the flood control storage is presently fixed by the Chief of Engineers, U.S. Army, at elevation 3,851 feet above mean sea level. The flood control storage will be operated for flood control purposes and to those ends will impound or regulate the streamflow volumes that are in excess of the then available storage capacity of the conservation pool. Releases from the flood control storage may be made at times and rates determined by the Corps of Engineers to be necessary or advisable without regard to ditch diversion capacities or requirements in either or both States.

(3) The conservation pool will be operated for the benefit of water users in Colorado and Kansas, both upstream and downstream from John Martin Dam, as provided in this Compact. The maintenance of John Martin Dam and appurtenant works may at times require the Corps of Engineers to release waters then impounded in the conservation pool or to prohibit the storage of water therein until such maintenance work is completed. Flood control operation may also involve temporary utilization of conservation storage.

D. This Compact is not intended to impede or prevent future beneficial development of the Arkansas River basin in Colorado and Kansas by Federal or State agencies, by private enterprise, or by combinations thereof, which may involve construction of dams, reservoir, and other works for the purposes of water utilization and control, as well as the improved or prolonged functioning of existing works: Provided, that the waters of the Arkansas River, as defined in Article III, shall not be materially depleted in usable quantity or availability for use to the water users in Colorado and Kansas under this Compact by such future development or construction.

ARTICLE V

Colorado and Kansas hereby agree upon the following basis of apportionment of the waters of the Arkansas River:

A. Winter storage in John Martin Reservoir shall commence on November 1st of each year and continue to and include the next succeeding March 31st. During said period all water entering said reservoir up to the limit of the then available conservation capacity shall be stored: Provided, that Colorado may demand releases of water equivalent to the river flow, but such releases shall not exceed 100 c.f.s. (cubic feet per second) and water so released shall be used without avoidable waste.

B. Summer storage in John Martin Reservoir shall commence on April 1st of each year and continue to and include the next succeeding October 31st. During said period, except when Colorado water users are operating under decreed priorities as provided in paragraphs F and G of this Article, all water entering said reservoir up to the limit of the then available conservation capacity shall be stored: Provided, that Colorado may demand releases of water equivalent to the river flow up to 500 c.f.s., and Kansas may demand releases of water equivalent to that portion of the river flow between 500 c.f.s. and 750 c.f.s., irrespective of releases demanded by Colorado.

C. Releases of water stored pursuant to the provisions of paragraphs A and B of this Article shall be made upon demands by Colorado and Kansas concurrently or separately at any time during the summer storage period. Unless increases to meet extraordinary conditions are authorized by the Administration, separate releases of stored water to Colorado shall not exceed 750 c.f.s., separate releases of stored water to Kansas shall not exceed 500 c.f.s., and concurrent releases of stored water shall not exceed a total of 1,250 c.f.s.: Provided, that when water stored in the conservation pool is reduced to a quantity less than 20,000 acre-feet, separate releases of stored water to Colorado shall not exceed 600 c.f.s., separate releases of stored water to Kansas shall not exceed 400 c.f.s., and concurrent releases of stored water shall not exceed 1,000 c.f.s.

D. Releases authorized by paragraphs A, B and C of this Article, except when all Colorado water users are operating under decreed priorities as provided in paragraphs F and G of this Article, shall not impose any call on Colorado water users that divert waters of the Arkansas River upstream from John Martin Dam.

E. (1) Releases of stored water and releases of river flow may be made simultaneously upon the demands of either or both States.

(2) Water released upon concurrent or separate demands shall be applied promptly to beneficial use unless storage thereof downstream is authorized by the Administration.

(3) Releases of river flow and of stored water to Colorado shall be measured by gaging stations located at or near John Martin Dam and the releases to which Kansas is entitled shall be satisfied by an equivalent in Stateline flow.

(4) When water is released from John Martin Reservoir appropriate allowances as determined by the Administration shall be made for the intervals of time required for such water to arrive at the points of diversion in Colorado and at the Stateline.

(5) There shall be no allowance or accumulation of credits or debits for or against either State.

(6) Storage, releases from storage and releases of river flow authorized in this Article shall be accomplished pursuant to procedures prescribed by the Administration under the provisions of Article VIII.

F. In the event the Administration finds that within a period of fourteen (14) days the water in the conservation pool will be or is liable to be exhausted, the Administration shall forthwith notify the State Engineer of Colorado, or his duly authorized representative, that commencing upon a day certain within said fourteen (14) day period, unless a

change of conditions justifies cancellation or modification of such notice, Colorado shall administer the decreed rights of water users in Colorado Water District 67 as against each other and as against all rights now or hereafter decreed to water users diverting upstream from John Martin Dam on the basis of relative priorities in the same manner in which their respective priority rights were administered by Colorado before John Martin Reservoir began to operate and as though John Martin Dam had not been constructed. Such priority administration by Colorado shall be continued until the Administration finds that water is again available in the conservation pool for release as provided in this Compact, and timely notice of such finding shall be given by the Administration to the State Engineer of Colorado or his duly authorized representative: Provided, that except as controlled by the operation of the preceding provisions of this paragraph and other applicable provisions of this Compact, when there is water in the conservation pool the water users upstream from John Martin Reservoir shall not be affected by the decrees to the ditches in Colorado Water District 67. Except when administration in Colorado is on a priority basis the water diversions in Colorado Water District 67 shall be administered by Colorado in accordance with distribution agreements made from time to time between the water users in such District and filed with the Administration and with the State Engineer of Colorado or, in the absence of such agreement, upon the basis of the respective priority decrees, as against each other, in said District.

G. During periods when Colorado reverts to administration of decreed priorities, Kansas shall not be entitled to any portion of the river flow entering John Martin Reservoir. Waters of the Arkansas River originating in Colorado which may flow across the Stateline during such periods are hereby apportioned to Kansas.

H. If the usable quantity and availability for use of the waters of the Arkansas River to water users in Colorado Water

District 67 and Kansas will be thereby materially depleted or adversely affected, (1) priority rights now decreed to the ditches of Colorado Water District 67 shall not hereafter be transferred to other water districts in Colorado or to points of diversion or places of use upstream from John Martin Dam; and (2) the ditch diversion rights from the Arkansas River in Colorado Water District 67, and of Kansas ditches between the Stateline and Garden City shall not hereafter be increased beyond the total present rights of said ditches, without the Administration, in either case (1) or (2), making findings of fact that no such depletion or adverse effect will result from such proposed transfer or increase. Notice of legal proceedings for any such proposed transfer or increase shall be given to the Administration in the manner and within the time provided by the laws of Colorado or Kansas in such cases.

ARTICLE VI

A. (1) Nothing in this Compact shall be construed as impairing the jurisdiction of Kansas over the waters of the Arkansas River that originate in Kansas and over the waters that flow from Colorado across the Stateline into Kansas.

(2) Except as otherwise provided, nothing in this Compact shall be construed as supplanting the administration by Colorado of the rights of appropriators of waters of the Arkansas River in said State as decreed to said appropriators by the courts of Colorado, nor as interfering with the distribution among said appropriators by Colorado, nor as curtailing the diversion and use for irrigation and other beneficial purposes in Colorado of the waters of the Arkansas River.

B. Inasmuch as the Frontier Canal diverts waters of the Arkansas River in Colorado west of the Stateline for irrigation uses in Kansas only, Colorado concedes to Kansas and Kansas hereby assumes exclusive administrative control over the operation of the Frontier Canal and its headworks for such

purposes, to the same extent as though said works were located entirely within the State of Kansas. Water carried across the Stateline in the Frontier Canal or another similarly situated canal shall be considered to be part of the Stateline flow.

ARTICLE VII

A. Each State shall be subject to the terms of this Compact. Where the name of the State or the term "State" is used in this Compact these shall be construed to include any person or entity of any nature whatsoever using, claiming or in any manner asserting any right to the use of the waters of the Arkansas River under the authority of that State.

B. This Compact establishes no general principle or precedent with respect to any other interstate stream.

C. Wherever any State or Federal official or agency is referred to in this Compact such reference shall apply to the comparable official or agency succeeding to their duties and functions.

ARTICLE VIII

A. To administer the provisions of this Compact there is hereby created an interstate agency to be known as the Arkansas River Compact Administration herein designated as "The Adminstration."

B. The Administration shall have power to:

(1) Adopt, amend and revoke by-laws, rules and regulations consistent with the provisions of this Compact;

(2) Prescribe procedures for the administration of this Compact: Provided, that where such procedures involve the operations of John Martin Reservoir Project they shall be subject to the approval of the District Engineer in charge of said Project;

(3) Perform all functions required to implement this Compact and to do all things necessary, proper or convenient in the performance of its duties.

C. The membership of the Administration shall consist of three representatives from each State who shall be appointed by the respective Governors for a term not to exceed four years. One Colorado representative shall be a resident of and water right owner in Water Districts 14 or 17, one Colorado representative shall be a resident of and water right owner in Water District 67, and one Colorado representative shall be the Director of the Colorado Water Conservation Board. Two Kansas representatives shall be residents of and water right owners in the counties of Finney, Kearny or Hamilton, and one Kansas representative shall be the chief State official charged with the adminsitration of water rights in Kansas. The President of the United States is hereby requested to designate a representative of the United States, and if a representative is so designated he shall be an ex-officio member and act as chairman of the Administration without vote.

D. The State representatives shall be appointed by the respective Governors within thirty days after the effective date of this Compact. The Administration shall meet and organize within sixty days after such effective date. A quorum for any meeting shall consist of four members of the Administration: Provided, that at least two members are present from each State. Each State shall have but one vote in the Administration and every decision, authorization or other action shall require unanimous vote. In case of a divided vote on any matter within the purview of the Administration, the Administration may, by subsequent unanimous vote, refer the matter for arbitration to the Representative of the United States or other arbitrator or arbitrators, in which event the decision made by such arbitrator or arbitrators shall be binding upon the Administration.

E. (1) The salaries, if any, and the personal expenses of each member shall be paid by the government which he represents. All other expenses incident to the administration of this Compact which are not paid by the United States shall be borne by the States on the basis of 60 per cent by Colorado and 40 per cent by Kansas.

(2) In each even numbered year the Administration shall adopt and transmit to the Governor of each State its budget covering anticipated expenses for the forthcoming biennium and the amount thereof payable by each State. Each State shall appropriate and pay the amount due by it to the Administration.

(3) The Administration shall keep accurate accounts of all receipts and disbursements and shall include a statement thereof, together with a certificate of audit by a certified public accountant, in its annual report. Each State shall have the right to make an examination and audit of the accounts of the Administration at any time.

F. Each State shall provide such available facilites, equipment and other assistance as the Administration may need to carry out its duties. To supplement such available assistance the Administration may employ engineering, legal, clerical, and other aid as in its judgment may be necessary for the performance of its functions. Such employees shall be paid by and be responsible to the Administration, and shall not be considered to be employees of either State.

G. (1) The Administration shall cooperate with the chief official of each State charged with the administration of water rights and with Federal agencies in the systematic determination and correlation of the facts as to the flow and diversion of the waters of the Arkansas River and as to the operation and siltation of John Martin Reservoir and other related structures. The Administration shall cooperate in the procurement, interchange, compilation and publication of all factual data bearing

upon the administration of this Compact without, in general, duplicating measurements, observations or publications made by State or Federal agencies. State officials shall furnish pertinent factual data to the Administration upon its request. The Administration shall, with the collaboration of the appropriate Federal and State agencies, determine as may be necessary from time to time, the location of gaging stations required for the proper administration of this Compact and shall designate the official records of such stations for its official use.

(2) The Director, U.S. Geological Survey, the Commissioner of Reclamation and the Chief of Engineers, U.S. Army, are hereby requested to collaborate with the Administration and with appropriate State officials in the systematic determination and correlation of data referred to in paragraph G (1) of this Article and in the execution of other duties of such officials which may be necessary for the proper administration of this Compact.

(3) If deemed necessary for the administration of this Compact, the Administration may require the installation and maintenance, at the expense of water users, of measuring devices of approved type in any ditch or groups of ditches diverting water from the Arkansas River in Colorado or Kansas. The chief official of each State charged with the administration of water rights shall supervise the execution of the Administration's requirements for such installations.

H. Violation of any of the provisions of this Compact or other actions prejudicial thereto which come to the attention of the Administration shall be promptly investigated by it. When deemed advisable as the result of such investigation, the Administration may report its findings and recommendations to the State official who is charged with the administration of water rights for appropriate action, it being the intent of this Compact that enforcement of its terms shall

be accomplished in general through the State agencies and officials charged with the administration of water rights.

I. Findings of fact made by the Administration shall not be conclusive in any court or before any agency or tribunal but shall constitute prima facie evidence of the facts found.

J. The Administration shall report annually to the Governors of the States and to the President of the United States as to matters within its purview.

ARTICLE IX

A. This Compact shall become effective when ratified by the Legislature of each State and when consented to by the Congress of the United States by legislation providing substantially, among other things, as follows:

"Nothing contained in this Act or in the Compact herein consented to shall be construed as impairing or affecting the sovereignty of the United States or any of its rights or jurisdiction in and over the area or waters which are the subject of such Compact: Provided, that the Chief of Engineers is hereby authorized to operate the conservation features of the John Martin Reservoir Project in a manner conforming to such Compact with such exceptions as he and the Administration created pursuant to the Compact may jointly approve."

B. This Compact shall remain in effect until modified or terminated by unanimous action of the States and in the event of modification or termination all rights then established or recognized by this Compact shall continue unimpaired.

IN WITNESS WHEREOF, The commissioners have signed this Compact in triplicate original, one of which shall be forwarded to the Secretary of State of the United States of America and one of which shall be forwarded to the Governor of each signatory State.

Done in the City and County of Denver, in the state of Colorado, on the fourteenth day of December, in the Year of our Lord One Thousand Nine Hundred and Forty-eight.

Henry C. Vidal
Gail L. Ireland
Harry B. Mendenhall
Commissioners for Colorado

George S. Knapp
Edward F. Arn
William E. Leavitt
Roland H. Tate
Commissioners for Kansas

Attest:
Warden L. Noe
Secretary

Approved:
Hans Kramer
Representative of the United States

No. _____, Original

IN THE

Supreme Court of the United States

October Term, 1985

STATE OF KANSAS,
Plaintiff,

v.

STATE OF COLORADO,
Defendant.

BRIEF IN SUPPORT OF MOTION FOR LEAVE TO FILE COMPLAINT

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Defendant.

BRIEF IN SUPPORT OF MOTION FOR LEAVE TO FILE COMPLAINT

STATEMENT OF THE CASE

This is an action to enforce the apportionment made to the State of Kansas by the Arkansas River Compact. Act of May 31, 1949, 63 Stat. 145. Since the Compact was enacted in 1949, continued development in Colorado, primarily by unregulated alluvial wells, has depleted the flows of the Arkansas River and has substantially impaired Kansas' entitlement under the Compact. Lacking any other effective remedy, Kansas

seeks to avail itself of the original jurisdiction of the Court to enjoin the continuing compact violations that are causing substantial and irreparable injury to downstream water users in Kansas.

The original jurisdiction of this Court is invoked under Article III, Section 2, Clause 2 of the United States Constitution and under the Judiciary Act, 28 U.S.C. § 1251 (a).

STATEMENT OF FACTS

The states of Colorado and Kansas agreed to an equitable apportionment of the waters of the Arkansas River in the Arkansas River Compact of December 14, 1948. *See,* Act of March 7, 1949, Kansas Gen. Stat. Ann. 1964 § 83a-520; Act of February 19, 1959, Colo Rev. Stat. 1963, § 149-9-1. The Compact resolved the longstanding conflict over each state's entitlement to the Arkansas River. *See, Kansas v. Colorado,* 206 U.S. 46 (1907); *Colorado v. Kansas,* 320 U.S. 383 (1943). Predicated on the construction of a major water conservation and storage project, John Martin Reservoir, the Compact's apportionment of the Arkansas River was intended to remove the ambiguity and uncertainty that had resulted in litigation and to allow for future development in the Arkansas River Basin, so long as the proposed development would not materially deplete in usable quantity or availability the flows of the river at the stateline. Article IV(D), 63 Stat. 145, 147. The Arkansas River Compact was approved and enacted into federal law by the Act of Congress of May 31, 1949, 63 Stat. 145.

As was anticipated by the states when the Compact was negotiated, the usable stateline flows increased as a result of the construction and operation of John Martin Reservoir. *See,* Article V, 63 Stat. 145, 147-149. Since 1974, however, there has been a substantial decrease in usable stateline flows.

According to numerous hydrologic studies, including studies conducted for the Colorado State Engineer and the Colorado Water Conservation Board, the primary cause of the post-compact depletions of stateline flows has been the development of some 1,500 unregulated alluvial wells in Colorado. *See, e.g.,* Colorado Office of the State Engineer, "Stream Depletion by Wells in the Arkansas River Basin," 1975; W. W. Wheeler and Associates and Woodward-Clyde Consultants, "Water Legislation Investigations for the Arkansas River Basin in Colorado," Vols. I & II, 1968; Luckey, Richard R. and Livingston, Russell K., "Reservoir Release Routing Model for the Upper Arkansas River Basin of Colorado," Colorado Water Resources Circular 27, 1975. The problem derived from the Colorado State Engineer's refusal to coordinate the administration of surface and tributary ground water. *See,* Moses & Vranesh, "Colorado's Ground Water Laws," 38 U.Colo.L.Rev. 294 (1966). Until 1965, after nearly all of the well development had taken place in Colorado, there was absolutely no administration of ground water withdrawals in the Arkansas River Basin of Colorado. *See, e.g.,* Hillhouse, "Integrating Ground & Surface Water Use in an Appropriation State," 20 Rocky Mountain Min. L. Inst. 691 (1975).

After Colorado's ground water depletions became manifest on surface flows at the stateline, Colorado's deficient administrative practices above John Martin Reservoir were raised by Kansas at meetings of the Arkansas River Compact Administration, the interstate body created to administer the provisions of the Compact. *See,* Article VIII, 63 Stat. 145, 149-151. Numerous special and regular meetings of the Administration were devoted to discussion of the problems, but essentially no progress was made toward their resolution. In 1982, the Attorneys General of both states met with the Administration to clarify the issues. After nearly two years of discussions and a protracted exchange of correspondence, the matter was brought to a head by an unsuccessful attempt

by Kansas to initiate arbitration pursuant to Article VIII(D) of the Compact. 63 Stat. 145, 149.

In September, 1983, the State of Kansas retained an independent consulting firm to begin an engineering and geohydrologic analysis of postcompact depletions in usable stateline flows. Following the preliminary assessment of its consulting engineers, Kansas also initiated a bilateral administrative investigation of the depletions pursuant to Article VIII(H) of the Compact. The Compact Administration resolved on March 28, 1985, pursuant to Article VIII(H), to investigate Kansas' allegations of compact violation, as well as counter-allegations made by Colorado. To carry out the Resolution a committee was created, consisting of the Director of the Colorado Water Conservation Board and the Chief Engineer of Kansas. The committee was charged with the conduct of the investigation and to report to the Administration "on a monthly basis in regard to each issue for which the investigation is incompleted."

As amended on July 12, 1985, the Resolution of March 28, 1985 calls for the prompt investigation of:

> 1. Whether the waters of the Arkansas River have been or are being materially depleted in usable quantity or availability for use to the water users in Colorado and Kansas under the Compact by:
>
> a. the operation of the Trinidad Dam and Reservoir Project, Colorado,
>
> b. the operation of Pueblo Dam and Reservoir, Colorado, and the winter water storage program on the Arkansas River in Colorado,
>
> c. well development of the waters of the Arkansas River in Colorado, and
>
> d. well development of the waters of the Arkansas River in Kansas;

2. Whether water released from John Martin Dam and Reservoir has been stored in Lake McKinney, Kansas, rather than being applied promptly to beneficial use, without the prior authorization of the Administration;

3. Whether the State of Colorado has complied with the provisions of Article V F of the Arkansas River Compact in the administration of the decreed rights of water users in Colorado Water District 67 as against each other and as against all rights now and hereafter decreed to water users diverting upstream from John Martin Dam, including groundwater rights, on the basis of relative priorities; and

4. Whether there have been increases in ditch diversion rights from the Arkansas River by Kansas ditches between the Stateline and Garden City beyond the rights existing at the time of the execution of the Compact, which increases have occurred without the Administration first making findings of fact that the usable quantity and availability for use of the waters of the Arkansas River to water users in Colorado Water District 67 and Kansas would not be thereby materially depleted or adversely affected.

Subsequently, the committee met on a monthly basis to pursue the investigation. In addition to existing studies of well depletions, the committee agreed to construct a series of eight mass diagrams, plotted in six different ways. It was agreed that mass diagrams could be used to identify postcompact changes in the regimen of the river, but that the diagrams would not be useful in isolating the cause or causes of any indicated change.

On July 12, 1985, the investigation committee held a third meeting in Lamar, Colorado. After preliminary discussions

failed to produce a consensus regarding the conclusions that could be drawn from the diagrams, it was agreed that each state would prepare a report interpretating the data and mass diagrams. Colorado's report, dated September 6, 1985, and Kansas' report dated September 4, 1985, contain the divergent findings and conclusions of the states. At its fourth meeting on September 17, 1985, the committee discussed the conclusions in the respective reports, but was unable to agree on the conclusions to be drawn from the studies and on what further investigation, if any, should be undertaken.

The committee met again on October 8, 1985. Prior to the meeting, the two states had exchanged their supplemental reports, *viz.*, "Supplemental Report to the Arkansas River Compact Administration Regarding the Article VIII(H) Investigation of Alleged Violations of the Arkansas River Compact," David L. Pope, October 4, 1985, and "Memorandum to the Arkansas River Administration," J. William McDonald, October 4, 1985.

The Colorado report concluded that the mass analyses indicated no significant historic depletions, with the possible exception of tributary inflow from the eastern plains of Colorado. Accordingly, Colorado took the position that only "plains precipitation during the period 1974-1982 is a matter that warrants further investigation." *Id.*, p. 22. Colorado also stated that it could not "agree to undertake an investigation into well development in Colorado when the single and double mass diagrams [did] not suggest that well development in Colorado [had] had an impact on usable stateline flows." *Id.*, p. 23. Kansas, on the other hand, based its view of the investigation on certain relevant engineering studies, the history of water use on the Arkansas River, and the single and double mass analyses, and concluded that there had been significant postcompact depletions, primarily from well development in the 1950s and

1960s, and that further bilateral investigation of the depletions should be undertaken in ten different areas.

On October 8, 1985, the Arkansas River Compact Administration adopted a resolution terminating the Article VIII(H) investigation except in the limited area of mutual agreement that the investigation should proceed. At that time, Colorado expressly refused to undertake an investigation into well development in Colorado until such time as an investigation of drought and soil convervation pointed to further investigation. In short, Colorado refused to investigate the substance of Kansas' claims concerning the material depletions in usable stateline flows caused by certain administrative practices and the proliferation of unregulated postcompact wells.

At the meeting of the Compact Administration on December 10, 1985, Colorado rejected Kansas' requests to investigate the impact on the Arkansas River of: 1) Colorado's substantial, postcompact ground water depletions of surface flows at the stateline; 2) the failure of Colorado to administer ground water priorities against surface priorities; 3) Colorado's artificially transferring water from the storage pool in Trinidad Reservoir to the sediment pool and then refilling the storage pool to the detriment of downstream users; 4) the consequences of expected future increases in the consumption of Colorado's transmountain return flows; and 5) Colorado's unilateral rejection of the Arkansas River Compact Administration's Resolution of July 24, 1951, requiring that any reregulation of the native waters of the Arkansas River be approved by the Compact Administration. Additionally, Colorado refused to enjoin its postcompact ground water appropriations which result in surface depletions, despite the fact that those appropriations materially deplete the usable and available flows of the Arkansas River. Consequently, Kansas has no alternative but to invoke the original jurisdiction of this Court to protect down-

stream water users in Kansas who are being harmed by Colorado's continuing violations of the Compact.

POINTS OF LAW

The Court has held that conflicts between states concerning entitlement to the waters of interstate streams may properly be adjudicated under the Court's original jurisdiction. Article III, Section 2, United States Constitution; 28 U.S.C. § 1251; *Nebraska v. Wyoming*, 325 U.S. 589 (1945); *Colorado v. Kansas*, 320 U.S. 383 (1943); *Wyoming v. Colorado*, 259 U.S. 419 (1922). In addition, the Court has exercised its original jurisdiction to determine the rights between two states to waters of an interstate stream that are equitably apportioned under a compact. *Texas v. New Mexico*, 421 U.S. 927 (1975). In this case, Colorado has violated the Arkansas River Compact by allowing substantial postcompact increases in water use. Colorado's actions have resulted in the material depletion of the Arkansas River and have impaired Kansas' entitlement as clearly defined by the Compact, a federal law, to the waters of the Arkansas River. Therefore, the case presents a justiciable controversy which ought to and can only be decided by this Court. *Hinderlider v. La Plata and Cherry Creek Ditch Co.*, 304 U.S. 92 (1938); *Texas v. New Mexico*, 462 U.S. 554 (1983).

The administrative investigation pursuant to Article VIII(H) has effectively terminated because of Colorado's refusal to cooperate. Colorado has taken the position that the investigation should continue at a snail's pace, in areas unrelated to the basic problem identified by all of the experts, including Colorado's own officers and consultants. In response to Colorado's stonewalling, and in view of the ongoing substantial injury to water users in Kansas, Kansas retained the internationally recognized firm of S. S. Papadopulos & Associates, Inc. to

evaluate the impact of postcompact well development and water use in Colorado on the Arkansas River. In its Report to the Arkansas River Compact Administration Regarding the Article VIII(H) Investigation of Alleged Violations of the Arkansas River Compact of December 6, 1985, Papadopulos & Associates express the opinion that postcompact well development in Colorado has unquestionably materially and substantially depleted the Arkansas River and that Colorado's purposeful attempt to avoid study of well depletions is not remotely justifiable on the basis of any hydrologic or engineering reason. The conclusion follows that Colorado seeks to delay or obstruct the Administration's investigation of postcompact wells to avoid the inevitable determination that the wells were and are resulting in compact violation.

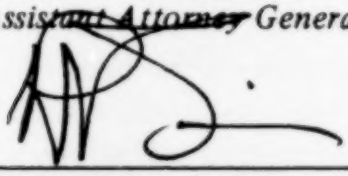
Colorado has followed and continues to follow a course of conduct that renders the administrative investigation a meaningless effort designed to delay a resolution of the conflict. At the same time, Colorado continues its ongoing violation of the Compact to the substantial injury of Kansas. Accordingly, the Court should exercise its jurisdiction to decide this controversy, which will result in a prompt and efficient resolution of an existing and inevitable conflict.

It is respectfully requested that the motion for leave to file the Complaint be granted.

Respectfully submitted,

ROBERT T. STEPHAN
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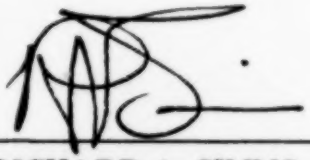


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CERTIFICATE OF SERVICE

I, Richard A. Simms, hereby certify, pursuant to Rule 9(2) of the Rules of the Supreme Court of the United States, that on the 16th day of December, 1985, I served the requisite number of copies of the foregoing Motion for Leave to File Complaint, Complaint, and Brief in Support of Motion for Leave to File Complaint, by first class mail, on the Governor and the Attorney General of the State of Colorado, and on opposing counsel.



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IN THE

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October Term, 1985

STATE OF KANSAS,
Petitioner,

v.

STATE OF COLORADO,
Respondents.

COLORADO'S BRIEF IN OPPOSITION TO MOTION FOR LEAVE TO FILE COMPLAINT.

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February 14, 1986

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INTRODUCTION

The State of Colorado respectfully requests the Court to deny the Motion for Leave to File Complaint filed by the State of Kansas. The complaint alleges material depletion of the waters of the Arkansas River in Colorado in violation of the Arkansas River Compact.[1] Colorado submits that Kansas has not made a reasonable effort to resolve this matter through the Arkansas River Compact Administration ("Administration").[2] Absent such an effort, this Court should decline to hear this matter.

Contrary to the suggestion by Kansas, there is substantial disagreement as to whether post-compact well development in Colorado has materially depleted the flow of the Arkansas River in violation of Article IV.D. and/or Article V.F. of the Arkansas River Compact. The Court should deny the motion for leave to file a complaint because Kansas has an adequate means for vindicating its concerns through a pending investigation by the Administration. *See Texas v. New Mexico,* 462 U.S. 554, 571 n. 18 (1983). Premature invocation of the Court's jurisdiction would deny the Court the benefit of the special

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[1]The United States Congress granted consent to Colorado and Kansas to negotiate a compact for the apportionment of the waters of the Arkansas River in 1945. Act of April 19, 1945, 59 Stat. 53. The Arkansas River Compact was signed by the commissioners appointed by Colorado and Kansas on December 14, 1948. The Compact was ratified by the legislature of each state and approved by Congress in 1949. Act of May 31, 1949, 63 Stat. 145. The Compact ended nearly fifty years of litigation over the use of waters of the Arkansas River. *See* Kansas v. Colorado, 206 U.S. 46 (1907); Colorado v. Kansas, 320 U.S. 383 (1943).

[2]The Arkansas River Compact Administration is an interstate agency created by the Arkansas River Compact to administer the provisions of the Compact. Art. VIII.A. The membership of the Administration consists of three representatives from each state appointed by the respective governors. Art. VIII.C. Each state has one vote in the Administration. Art. VIII.D.

expertise and abilities of the Administration in addressing complex hydrologic facts about ground water usage and would saddle this Court with burdensome original jurisdiction litigation over complaints that can be resolved or narrowed by the Administration.[3] *Id.; Far East Conference v. United States,* 342 U.S. 570, 574-75 (1952). In that regard, Colorado agrees with the United States Representative to the Administration[4] that the Arkansas River Compact obligates a complaining state to make a reasonable effort to pursue resolution through the mechanisms provided for in the Compact before resorting to litigation against the other compacting state.[5] Colorado also agrees with the United States Representative that Kansas has not followed

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[3]The Compact directs the Administration to investigate promptly violation of any of the provisions of the Compact or other actions prejudicial thereto which come to its attention. Art. VIII.H; *see also* Art. VIII.G. relating to the fact-finding duties of the Administration. When deemed advisable as the result of an investigation, the Administration can report its findings and recommendations to the state official charged with administration of water rights for appropriate action. Art. VIII.H. Findings of fact made by the Administration are not conclusive, but do constitute *prima facie* evidence of the facts found. Art. VIII.J. This provision is nearly identical to Article V(f) of the Pecos River Compact. *See* Texas v. New Mexico, 462 U.S. 554, 568 n. 14 (1983).

[4]The Compact provides for the President to designate a representative of the United States to the Administration to act as chairman but without vote. Art. VIII.C.

[5]*See* Remarks of the U.S. Representative to the Arkansas River Compact Administration at the annual meeting of the Administration held in Pueblo, Colorado. (Dec. 10, 1985) (printed in Appendix A). However, Colorado does not agree with the suggestion by the U.S. representative that it is essential that there be an arbitration of every dispute under the Compact. Article VIII.D. of the Compact merely provides that in the case of a divided vote on any matter within the purview of the Administration, the Administration "may" refer a matter for arbitration by a subsequent unanimous vote of both states. Whether arbitration is appropriate to resolve a matter under the Compact depends on agreement of the states on a case-by-case basis.

"those procedures which appear to me clearly to be reasonable and necessary before either [state] successfully claims that its administrative remedies have been exhausted and that it must seek relief outside or beyond the Compact Administration."[6]

STATEMENT OF THE QUESTION PRESENTED

Has the State of Kansas met its burden to demonstrate that a pending investigation by the Arkansas River Compact Administration is not an adequate means to vindicate its allegations of Compact violations?

SUPPLEMENTAL STATEMENT OF FACTS

Colorado supplements the statement of facts in the Kansas brief to permit the Court to determine whether Kansas has met its burden to demonstrate the necessity of an original forum in this Court.

A. Administration Investigation

On March 28, 1985, at the request of Kansas and Colorado, the Administration adopted a resolution, by unanimous vote, to investigate a number of allegations of violations of the Compact, including well development in both states. *See* Kansas Brief at 4. The resolution established a committee consisting of the director of the Colorado Water Conservation Board or his designee and the Chief Engineer of Kansas or his designee to conduct the investigation.[7] Beginning in April, 1985, the com-

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[6]Appendix A at 4a.

[7]The director of the Colorado Water Conservation Board and the Chief Engineer of the Kansas Division of Water Resources are *ex officio* members of the Administration. Art. VIII.C. Both agencies have considerable expertise in conducting water investigations. *See, e.g.,* Colo.Rev. Stat. §37-60-101, *et seq.* (1973), as amended, for the powers and duties of the Colorado Water Conservation Board. In addition, the Compact provides that state officials shall furnish pertinent factual data to the Administration upon its request. Art. VIII.G. (1). The director of the U.S. Geological Survey, the commissioner of the U.S. Bureau of Reclamation, and the chief engineer of the U.S. Army Corps of Engineers are also requested to assist the Administration in the execution of its duties. Art VIII.G(2).

mittee devoted substantial efforts to establishing a data base and preparing a mass diagram analysis to determine if there had been any changes in the relationship between streamflows at selected locations in the Arkansas River Basin. *Id.* at 5.

On July 12, 1985, at the request of the Kansas representatives, the Administration agreed to amend the March 28, 1985 resolution to include an investigation of whether Colorado had complied with the provisions of Article V.F. of the Compact concerning the administration of decreed rights in Colorado on the basis of relative priorities. See Kansas Brief at 4.

On October 8, 1985, after extensive reports were submitted by both committee members on the status of the investigation, the Administration expressly authorized the committee to "continue with its investigation of the matters upon which the Committee has mutually agreed that further investigation should be undertaken."[8]

Approximately two weeks later, on October 25, 1985, Kansas Attorney General Robert Stephan announced to an interim committee of the Kansas legislature that effective relief was not available through the Administration and that he had directed his staff to initiate litigation against Colorado to be filed on December 16, 1985. Topeka Capital J., Oct. 26, 1985, at 1, Col. 1.

To understand the reason for the disagreement between the Kansas Attorney General and the Administration on how the investigation should proceed, the following background facts concerning well regulation in the Arkansas River Valley in Colorado are necessary.

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[8]Resolution adopted at Arkansas River Compact Administration meeting held at Garden City, Kansas (Oct. 8, 1985) (printed in Appendix B).

B. Background Facts

Prior to 1965, the Colorado State Engineer believed he had no authority to regulate ground water diversions. *See Fellhauer v. People,* 167 Colo. 320, 328, 447 P.2d 986, 990 (1968). In 1965, the Colorado General Assembly enacted legislation to vest the State Engineer with clear authority to regulate ground water diversions in the priority system and to regulate the issuance of new well permits. The Colorado water officials then attempted to curtail out-of-priority diversions by a group of wells in the Arkansas River Basin. The Colorado Supreme Court held that this attempt to enforce the 1965 legislation was unconstitutional and set forth three requirements for the valid and constitutional regulation of wells in the Arkansas River Valley. *Id.* at 334-35, 447 P.2d at 993. The District Court's decision in that case prompted the Colorado General Assembly to authorize an investigation to determine, *inter alia,* the need for legislation that would provide for integrated administration of surface and ground water. 1967 Colo. Sess. Laws, Ch. 175, §1. One of the studies prepared in connection with this investigation is the first of the three studies cited in the Kansas brief. W. W. Wheeler and Associates and Woodward-Clyde & Associates, Water Legislation Investigations for the Arkansas River Basin in Colorado (1968).

In 1969, the Colorado General Assembly enacted the Water Right Determination and Administration Act of 1969. Colo. Rev.Stat. §37-92-101, *et seq.* (1973), as amended (hereinafter the "1969 Act"). On November 16, 1972, pursuant to the authority granted in the 1969 Act to integrate the administration of surface and tributary ground water in the Arkansas River Valley, the Colorado State Engineer promulgated rules and regulations to progressively curtail ground water uses in the Arkansas River

Valley four days a week to protect senior appropriators.[9] These rules have been in continuous effect for the past thirteen years.

On January 4, 1974, the State Engineer proposed an amendment to the rules and regulations to further curtail ground water uses. Protests to the amendment were filed by various well owners under the provisions of the 1969 Act providing for notice and an opportunity to be heard prior to the enforcement of amendments to existing rules and regulations. Colo.Rev.Stat. §37-92-501(2) (f)-(h). After hearings on protests to the amendment, the Colorado Water Judge for Water Division No. 2[10] entered a judgment disapproving the proposed amendment and ordered that the existing rules and regulations be continued in effect. *In re the Amendment of the Rules and Regulations Governing the Use, Control and Protection of Surface and Ground Water Rights Located in the Arkansas River and Its Tributaries,* Case Nos. W-4079, W-4080, W-4083, W-4084, and W-4085 (Dist. Ct., Water Division No. 2, Dec. 1, 1976), *aff'd sub. nom. Kuiper v. Atchison, Topeka & Sante Fe Ry.,* 195 Colo. 557, 581 P.2d 293 (1978).

The Water Judge found that notwithstanding the theoretical analyses offered by the State Engineer to support his contention that wells had depleted surface flows of the Arkansas River, there was no competent evidence in the record that stream flows had in fact suffered during the post-well period or that reduc-

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[9]Hillhouse, *Integrating Ground and Surface Water Use in an Appropriation State,* 20 Rocky Mountain Min. L. Inst. 691 (1975), describes Colorado's efforts to regulate ground water up to that time.

[10]Under the 1969 Act, Colorado was divided into seven water divisions based on major drainage basins and sub-basins. Colo.Rev.Stat §37-92-201. A district judge in each water division was designated as a "water judge" with exclusive jurisdiction over "water matters." Colo.Rev.Stat. §37-92-203(l) (1985 Cum. Supp.). The Arkansas River and its tributaries in the State of Colorado were included in Water Division No. 2. Colo.Rev.Stat. §37-92-201(1)(b).

tions, if any, could be traced to well diversions rather than to other causes, including increased irrigation efficiencies, phreatophyte and evaporation losses, or declines in tributary inflow. The Water Judge considered the reports cited in the Kansas brief but concluded that they ignored numerous factors which could increase or decrease river flow and were based on assumptions about ground water diversions which were not supported by competent evidence. The Water Judge's decision was affirmed on appeal by the Colorado Supreme Court. *Kuiper v. Atchison, Topeka & Sante Fe Ry., supra.* It was against this background that the committee began its investigation of well development in Colorado.

POINTS OF LAW

The Court exercises its original jurisdiction sparingly. *United States v. Nevada,* 412 U.S. 534, 538 (1973). The Court recently stated that it has "substantial discretion to make case-by-case judgments as to the practical necessity of an original forum in this Court for particular disputes within our constitutional original jurisdiction." *Texas v. New Mexico,* 462 U.S. 554, 570 (1983).

Where a compact creates an interstate agency to administer the provisions of the compact, and that agency is directed to investigate violations of the provisions of a compact and to report its findings and recommendations to the state officials charged with the administration of water rights for appropriate action, a compact provides an adequate means for vindicating either state's complaints of compact violations, in the absence of unusual circumstances, such as bad faith, inability to act, or undue delay. *See Texas v. New Mexico,* 462 U.S. 554, 571 n. 18 (1983). This is analogous to the doctrine of primary jurisdiction which

> applies where a claim is originally cognizable in the courts, and comes into play whenever enforcement of the claim

> requires the resolution of issues which, under a regulatory scheme, have been placed within the special competence of an administrative body; in such a case the judicial process is suspended pending referral of such issues to the administrative body for its views.

United States v. Western Pacific R. R., 352 U.S. 59, 64 (1956). The doctrine is based on the principle

> that in cases raising issues of fact not within the conventional experience of judges or cases requiring the exercise of adminstrative discretion, agencies created by Congress for regulating the subject matter should not be passed over.

Far East Conference v. United States, 342 U.S. 570, 574 (1952).

SUMMARY OF ARGUMENT

Colorado believes that there are persuasive reasons to deny the Motion for Leave to File Complaint. To summarize:

1. there is a pending investigation by the Administration of post-compact development in Colorado and Kansas;
2. the Administration is not deadlocked or unable to act, but has been proceeding in a cooperative manner to conduct the investigation;
3. the investigation of well development in Colorado raises complex issues of fact "not within the conventional experience of judges," *Far East Conference v. United States*, 342 U.S. at 574;
4. passing over the Administration would deny the Court the special expertise of the Administration in adressing complex hydrologic facts concerning ground water use and would burden the Court with a dispute that might be resolved by the Administration; and

5. there is little likelihood of injury while the investigation continues.

ARGUMENT

Kansas urges the Court to grant its motion for leave to file its complaint on the grounds that it made an attempt to have the Administration investigate its complaints, but the investigation is proceeding at a "snail's pace" and Colorado "has followed and continues to follow a course of conduct that renders the administrative investigation a meaningless effort designed to delay a resolution of the conflict." Kansas Brief at 8, 9. The facts simply do not support these contentions. First, Kansas did not request the Administration to investigate its principal allegation concerning post-compact well development in Colorado until March 28, 1985. Second, the Colorado representatives did not refuse to investigate the substance of the Kansas allegation. Third, there is substantial disagreement over the facts which can only be resolved by further investigation.

A. The Arkansas River Compact Administration Has Not Had A Reasonable Opportunity To Investigate The Kansas Allegation That Well Development In Colorado Has Materially Depleted Stateline Flows In Violation Of The Compact.

The principal allegation in the proposed complaint is that post-compact well development in Colorado has materially depleted the flow of the Arkansas River in violation of Article IV.D. of the Arkansas River Compact. Complaint, ¶ 8-10; Kansas Brief at 1.

Kansas admits, however, that the well development of which it complains occurred almost exclusively *prior to 1965.* Kansas Brief at 3. Nevertheless, and despite its allegation that since 1974 there has been a substantial decrease in usable stateline flows, *id.* at 2, it was not until March 28, 1985, that Kansas, *for*

the first time, requested the Administration to investigate whether well development in Colorado had caused material depletion to the waters of the Arkansas River. The Kansas brief implies that well development in Colorado had been the subject of discussion by the Administration for several years:

> *After Colorado's ground water depletions became manifest on surface flows at the stateline,* Colorado's deficient *administrative practices* above John Martin Reservoir were raised by Kansas at meetings of the Arkansas River Compact Administration, the interstate body created to administer the provisions of the Compact . . . . Numerous special and regular meetings of the Administration were devoted to discussion of the *problems,* but essentially no progress was made toward their resolution. In 1982, the Attorneys General of both states met with the Administration to clarify the *issues.* After nearly two years of discussions and a protracted exchange of correspondence, the *matter* was brought to a head by an unsuccessful attempt by Kansas to initiate arbitration pursuant to Article VIII(D) of the Compact . . .

Kansas Brief at 3-4 (emphasis added) (citations omitted).

By the use of the terms "administrative practices," "problems," "issues," and "matter," Kansas seeks to convey the impression that these efforts related to its allegation concerning ground water depletions in Colorado. This is not true. The events described in the above-quoted passage from the Kansas brief related to disputes over the operation of Trinidad Reservoir and Pueblo Reservoir in Colorado. *See infra* pp. 17-18. It was not until March 28, 1985, that Kansas requested the Administration to investigate well development in Colorado. At that time the Administration agreed to investigate a number of allegations of violations of the Compact, including well development in both states. *See* Kansas Brief at 4.

As noted in Colorado's supplemental statement of facts, after extensive reports were submitted, the Administration authorized the committee to continue with the investigation on October 8, 1985. The assertion that the pending investigation was proceeding at a "snail's pace" and was a "meaningless effort designed to delay a resolution of the conflict," Kansas Brief at 8, 9, was made by the Kansas Attorney General, not by the Kansas representatives to the Administration, who authorized the investigation to continue on the basis of matters mutually agreed to by the committee established to conduct the investigation.[11]

B. The Colorado Representatives Did Not Refuse To Investigate The Substance Of The Kansas Allegation Concerning Well Development In Colorado.

Kansas briefly notes the substantial effort devoted to the investigation by the committee to establish a data base and prepare a mass diagram analysis of streamflows at selected locations in the Arkansas River Basin. Kansas Brief at 5. The committee then submitted reports to the Administration prior to its October 8, 1985 meeting. Kansas summarizes the report by the director of the Colorado Water Conservation Board as follows:

> The Colorado report concluded that the mass analyses indicated no significant historic depletions, with the possible exception of tributary inflow from the eastern plains of Colorado. Accordingly, Colorado took the position that only "plains precipitation during the period 1974-1982 is a matter that warrants further investigation." ['Memorandum to the Arkansas River Compact Administration,' J. William McDonald, October 4, 1985] p. 22.

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[11]Despite the Kansas Attorney General's announcement on October 25, 1985, the committee proceeded in good-faith with the investigation and met on November 19, 1985, and again on December 10, 1985.

Kansas Brief at 6. This misstates the conclusions and recommendations in the report to the Administration by Mr. McDonald, the director of the Colorado Water Conservation Board. Mr. McDonald's report first set forth points of agreement in previous committee reports and the basis for his conclusions drawn from the mass diagrams prepared during the investigation:

> First, I agree with Mr. Pope [the Kansas Chief Engineer] that there was a substantial decline in usable stateline flows starting in 1974, although I believe this period should be divided at 1980 because changes in the operation of John Martin Reservoir starting in that year affected usable stateline flow. Second, I agree that the relationship between the annual flows of the Arkansas River at Canon City and Las Animas have been fairly constant over the entire post-compact period and that the causes of the decline in usable stateline flows starting in 1974 have been below Las Animas.
>
> Looking at the reach below Las Animas, I concluded that the decline in usable stateline flows from 1974-1979 coincided with a period of below-average flow at Las Animas and a period of drastic decline in tributary inflow from plains drainage areas of eastern Colorado, as reflected in the streamflow records of the Purgatoire River near Las Animas and Big Sandy Creek. I noted that there had been previous declines in usable stateline flows during drought periods, but that previous droughts have been broken up after two or three years by average or above-average flows, whereas the drought cycle in the 1970's lasted for a period of six years before there was a return to average and above-average flows. Further, I noted that usable stateline flows began improving in 1980 when precipitation and streamflow began to recover throughout the basin. Therefore, I concluded that the decline in usable

stateline flows was directly related to a decline in tributary inflow from plains drainage areas, combined with below-average flows at Las Animas.

Memorandum from J. William McDonald to the Arkansas River Compact Administration, 4-5 (Oct. 4, 1985) (citations omitted). The report reviewed in detail the reasons for the disagreement as to the possible causes of the decline in usable stateline flows beginning in 1974 and then set forth matters which Mr. McDonald thought were appropriate for further investigation:

> As noted above, both reports are in general agreement that the changes in relationship shown by the double-mass curves occurring since 1974 have been below the Las Animas gage on the Arkansas River. This isolates the reach appropriate for further investigation.
>
> In my opinion, plains precipitation during the period 1974-1982 is a matter that warrants further investigation. In addition, tributary inflow from plains drainage areas may have declined during the period 1974-1979 as the result of soil conservation measures. Such conservation measures were found to have had a substantial effect on streamflow in the Republican River Basin. If, after an investigation of the factors which appear most likely to have caused the decline in usable stateline flows during the period 1974-1982, including: 1) reduced diversions by ditches in Colorado Water District 67; 2) the operating plan for John Martin Reservoir; 3) decreased plains precipitation; and 4) soil conservation measures, it does not appear that this decline can be entirely attributed to such factors, then a further investigation of possible causes may be justified. However, *at this time,* I cannot agree to undertake an investigation into well development in Colorado when the single and double-mass diagrams do not suggest that well development in Colorado has had an impact on usable stateline flows.

Id. at 22-23 (emphasis added).

At the Administration's meeting on October 8, 1985, Mr. McDonald amplified his report by saying that he was not refusing to investigate any potential cause of the decline in usable stateline flows, only that he did not feel that evidence justified the expense of developing a stream-aquifer computer model when there appeared to be more likely causes than well development for the decline in usable stateline flows beginning in 1974.[12]

Kansas then goes on to assert that on October 8, 1985, the Administration adopted a resolution "*terminating* the Article VIII (H) investigation except in the limited area of mutual agreement that the investigation should proceed." Kansas Brief at 7 (emphasis added). Kansas contends that Colorado thereby "refused to investigate the substance of Kansas' claims concerning the material depletions in usable stateline flows caused by certain administrative practices and the proliferation of unregulated postcompact wells." *Id.*

This mischaracterizes both the McDonald report and the Administration's resolution of October 8, 1985, which did not *terminate* the investigation; the resolution provided that the committee "shall *continue* with its investigation of the matters upon which the Committee has mutually agreed that further investigation should be undertaken." Appendix B (emphasis added). Thus, the disagreement was not over whether to investigate, but what to investigate first.

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[12]Minutes of Arkansas River Compact Administration meeting held at Garden City, Kansas, 31-32 (Oct. 8, 1985).

C. The Findings By The Colorado Water Court Demonstrate That There Is a Good-Faith Dispute As To Whether Well Development In Colorado Has Materially Depleted Stateline Flows.

Kansas asserts that well development is the "basic problem identified by all of the experts, including Colorado's own officers and consultants," Kansas Brief at 8, and that any suggestion to the contrary is merely "stonewalling" to "delay or obstruct the Administration's investigation of post-compact wells to avoid the inevitable determination that the wells were and are resulting in compact violation." *Id.* at 8, 9. The impression left by Kansas is that Colorado has made no effort to curtail diversions from post-compact wells despite the existence of reports suggesting that well development is the primary cause of post-compact depletions to flows of the Arkansas River. This misrepresents the facts.

The Colorado State Engineer believed that he did not have authority to administer well diversions prior to 1965. *See Fellhauer v. People,* 167 Colo. 320, 328, 447 P.2d 986, 990 (1968). Colorado, however, was not unique in this respect. Few states, Kansas being no exception, had adequate laws for the coordinated administration of surface and related ground water at the time.[13] However, since 1965, the Colorado State Engineer has made substantial efforts to regulate ground water diversions in the Arkansas River Valley. *See supra pp. 5-6.* As for the reports prepared for the Colorado State Engineer and the Colorado

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[13]Ironically, Kansas did not impose a moratorium on the issuance of new well permits in the Arkansas River Valley in Hamilton and Kearney Counties until 1977, at which time the Kansas Division of Water Resources entered into a five-year cooperative study with the United States Geological Survey to investigate ground water development in the moratorium area. R. Baker, L. Dunlap, B. Sauer, *Analysis and Computer Simulation of Stream-Aquifer Hydrology, Arkansas River Valley, Southwestern Kansas,* U.S.G.S. Water-Supply Paper 2200 at 1, 3 (1983). Hamilton and Kearney Counties are located in the Arkansas River Basin nearest the Colorado-Kansas stateline. *See* attached Map of Arkansas River Basin.

Water Conservation Board, the Colorado Water Court concluded that the theoretical analyses in those reports were not supported by empirical evidence based on streamflow records and that they ignored numerous factors besides well diversions which could increase or decrease river flow and were based on assumptions about ground water diversions that were not supported by competent evidence. While Colorado does not suggest that this decision is binding on Kansas, *see Hinderlider v. La Plata & Cherry Creek Ditch Co.*, 304 U.S. 92, 103 (1938), we do think that a presumption of correctness attaches to the decree under the Compact, which provides that it is "the intent of this Compact that enforcement of its terms shall be accomplished in general through the State agencies and officials charged with the administration of water rights." Art. VIII.H.

Thus, far from being the problem identified by all of the experts, there is substantial evidence that well development in Colorado has been offset by other factors. Every expert who has studied the regimen of the Arkansas River in Colorado, including S.S. Papadopulos & Associates, Inc., has noted that it is "a highly complex system that has been altered by the construction of canals, reservoirs, wells, and inter-basin diversion systems."[14]

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[14]S.S. Papadopulos & Associates, Inc., Report to the Arkansas River Compact Administration Regarding the Article VIII(H) Investigation of Alleged Violations of the Arkansas River Compact, 5 (Dec. 6, 1985). This six-page report was not requested by the Administration but was apparently prepared for the Kansas Attorney General to support the decision to initiate litigation against Colorado. The Papadopulos firm made no independent investigation of well development in Colorado, but merely reviewed the committee reports and various written reports, including those prepared for the Colorado State Engineer and the Colorado Water Conservation Board. The Papadopulos report simply concluded: "Given the complexity of water distribution and use in the Arkansas River Valley, it is imperative that additional investigations consider all factors that may have affected historical streamflow patterns." *Id.* at 6. No one disagrees that further investigation is necessary; the question is how to proceed.

These facts demonstrate that the investigation involves highly complex issues of hydrologic facts, that reasonable experts differ as to the conclusions drawn from the facts at this time, and that further investigation is indeed warranted. It is not the function of this Court to second-guess the Administration on how the investigation ought to be conducted. *See Texas v. New Mexico,* 462 U.S. 554, 570-71 (1983). Nor do the remaining allegations in the complaint support the claim that Kansas has no alternative but to invoke the original jurisdiction of this Court.

D. Other Matters Raised By Kansas Do Not Justify An Original Forum In This Court.

Kansas also alleges that the Colorado representatives to the Administration have rejected requests to investigate: 1) "Colorado's artifically transferring water from the storage pool in Trinidad Reservoir to the sediment pool and then refilling the storage pool to the detriment of downstream users;" 2) "the consequences of future increases in the consumption of Colorado's transmountain return flows;" and 3) "Colorado's unilateral rejection of the Arkansas River Compact Administration's Resolution of July 24, 1951, requiring that any reregulation of the native waters of the Arkansas River be approved by the Compact Administration." Complaint, ¶ 12.

First, with regard to the operation of Trinidad Reservoir,[15] the Colorado representatives did in fact agree to an investiga-

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[15]The Trinidad Project was authorized by the United States Congress in the Flood Control Act of 1958, 72 Stat. 297, 309, *amended by* Act of Oct. 27, 1965, 79 Stat. 1073, 1079. *See* attached Map of Arkansas River Basin. The reservoir was completed and declared ready for the impoundment of water on January 1, 1977; however, storage in substantial amounts did not begin until 1979 because of litigation among Colorado water users. *See* Purgatoire River Water Conservancy Dist. v. Kuiper, 197 Colo. 200, 593 P.2d 333 (1979) (reversing trial court order enjoining storage in the reservoir).

tion of storage in the reservoir under Article VIII.H. of the Compact at a special meeting of the Administration on June 30, 1980. Annual Report, Arkansas River Compact Administration, 47 (1980). At a special meeting on September 25, 1980, the Administration approved findings of fact concerning storage and transfer of water in Trinidad Reservoir during 1979 and 1980 based upon the results of the investigation authorized by the Administration. *Id.* at 12-15. However, the Colorado representatives did not agree that these facts established a violation of the Compact and further investigation was agreed to. *Id.* at 48.

Without reviewing the entire history of the controversy, it is sufficient to point out that Kansas subsequently asserted that Trinidad Reservoir was not being operated in conformity with Operating Principles for the project approved by Kansas and the Administration in 1967. However, that very issue is being addressed in a review by the U.S. Bureau of Reclamation required by the Operating Principles. A draft of this review was submitted to interested parties, including Kansas, on December 20, 1985, with a request for comments by February 15, 1986. Thus, Colorado did not refuse to investigate the operation of Trinidad Reservoir. Moreover, Kansas has adequate means to address its concerns about the operation of the project through the review process being conducted by the U.S. Bureau of Reclamation. *See United States v. Nevada,* 412 U.S. 534, 538 (1973); *Illinois v. Milwaukee,* 406 U.S. 91, 93-94 (1972).

Second, with regard to potential *future* increases in the consumption of transmountain return flows, the director of the Colorado Water Conservation Board concluded during the investigation that the potential consequences were speculative at this time and would be extremely difficult to determine. While Kansas is correct that the Colorado representatives refused to investigate the potential consequences of future increases in the consumption of transmountain return flows,

this is a hypothetical controversy which is not ripe for adjudication. *United Public Workers v. Mitchell,* 330 U.S. 75 (1947).

Third, with regard to the Administration's Resolution of July 24, 1951, the resolution expressed as a policy of the Administration that there be no reregulation of native waters of the Arkansas River as proposed in a report on the Gunnison-Arkansas Project until a plan of operation had been submitted to and approved by the Administration. When this matter was first raised by Kansas in 1982, the Colorado representatives did not agree that the resolution was applicable to the Fryingpan-Arkansas Project, a major transmountain water diversion project which was authorized by Congress in 1962, of which Pueblo Reservoir is a component. Act of August 16, 1962, 76 Stat. 389. However, even if the resolution were applicable to the Fryingpan-Arkansas Project, Colorado believes that the policy of prior approval set forth in the 1951 resolution was waived when the Administration failed to raise an objection to the winter storage program in Pueblo Reservoir for at least six years after it began operation in 1975 with the full knowledge of the Administration! Furthermore, the Colorado representatives agreed in the resolution of March 28, 1985, to investigate the operation of the winter storage program in Pueblo Reservoir, Kansas Brief at 4, notwithstanding the fact that the United States Geological Survey ("U.S.G.S.") had performed a review of the potential reduction of inflow to John Martin Reservoir from winter storage in Pueblo Reservoir in 1981 based upon a request of the Kansas representatives. The U.S.G.S. concluded, consistent with its previous evaluation of winter storage in Pueblo Reservoir in 1975, that there was no indication of reduced inflow to John Martin Reservoir and that the evaluation suggested a possible increase. The U.S.G.S. duly reported its findings to the Administration at a special meeting on August 6, 1981. Annual Report, Arkansas River Compact Administration 44-49, 51 (1981). In light of the fact that the

Administration has agreed to investigate the operation of Pueblo Reservoir, the Kansas complaint does not raise a substantial question justifying an original action in this Court.

E. There Is Little Likelihood Of Injury To Kansas If The Administration Proceeds With Its Investigation.

Finally, a relevant consideration in making a judgment as to the practical necessity of an original forum in this Court is whether any delay while the investigation by the Administration proceeds is likely to work to the substantial detriment of Kansas. *See Texas v. New Mexico,* 462 U.S. 554, 568-69 (1983). In this case, there is little likelihood of injury to Kansas in the immediate future.

Not all water that crosses the stateline is divertible or usable in Kansas. *See Colorado v. Kansas,* 320 U.S. 383, 396 (1943). Article IV.D. of the Compact provides: "This Compact is not intended to impede or prevent future beneficial development of the Arkansas River basin in Colorado . . . . Provided, that the waters of the Arkansas River, as defined in Article III, shall not be materially depleted in usable quantity or availability for use to the water users in Colorado and Kansas under this Compact by such future development or construction."

Even assuming that the Kansas allegations concerning post-compact developments in Colorado were true, those developments would not be in violation of Article IV.D. when those developments do not materially deplete the divertible and usable quantity of water available to water users in Kansas. In some years, more water crosses the stateline than is divertible or usable in Kansas. This has been the case in recent years. For example in 1985, the conservation pool in John Martin Reser-

voir[16] filled and excess water had to be released for flood control purposes. According to the records of the Operations Secretary for the Administration, the conservation pool is nearly full at the present time. Thus, there is little likelihood that Kansas could be injured in the immediate future if the investigation by the Administration continues.

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[16]John Martin Reservoir is the storage space created by John Martin Dam. Art. III.D. The reservoir is located on the mainstem of the Arkansas River in Bent County, Colorado, approximately fifty-eight miles upstream from the Colorado-Kansas stateline. Arkansas River Compact: *Hearings on S. 1448 Before the Senate Comm. on Interior and Insular Affairs,* 81st Cong., 1st Sess., 28, 32 (1949) (statement of General Hans Kramer, Retired, U.S. Representative, Arkansas River Compact Comm'n.). *See* attached Map of Arkansas River Basin. The reservoir had an original storage capacity of approximately 700,000 acre-feet, of which 420,000 acre-feet was initially allocated to water conservation. *Id.* at 33. A major purpose of the Compact was to apportion between Colorado and Kansas the benefits arising from the operation of the reservoir for conservation purposes. Art. I.A.

CONCLUSION

Colorado concludes by noting this Court's admonition in *Texas v. New Mexico,* 462 U.S. 554 (1983):

> Time and again we have counselled States engaged in litigation with one another before this Court that their dispute 'is one more likely to be wisely solved by co-operative study and by conference and mutual concession on the part of the representatives of the States which are so vitally interested than by proceedings in any court however constituted.'. . .

Id. at 575 (citations omitted).

The principal allegation in the proposed complaint is that post-compact well development in Colorado has materially depleted the usable stateline flow of the Arkansas River in violation of Article IV.D. of the Compact. Investigation of this allegation calls for a high degree of expert and technical knowledge. However, even experts who are trained and experienced in conducting hydrologic investigations can differ in their interpretation of the technical facts. Colorado believes the Court should be sensitive to charges that one state or the other is using an investigation for the purpose of delay; but, in this case, Colorado does not believe the facts are susceptible to that construction. At bottom, the Kansas Attorney General simply disagreed with the cooperative approach to the investigation which the Administration adopted at its meeting on October 8, 1985. In Colorado's view, the Administration, unlike the Kansas Attorney General, recognized that the dispute was more likely to be "wisely solved" by a cooperative study than by litigation.

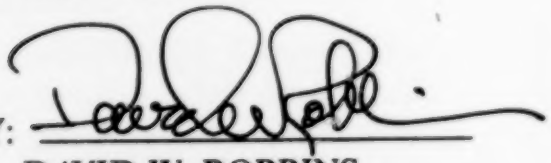
For the foregoing reasons, Colorado respectfully moves the Court to deny the motion for leave to file the complaint.

Respectfully submitted,

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APPENDIX A

REMARKS OF THE U.S. REPRESENTATIVE TO THE ARKANSAS RIVER COMPACT ADMINISTRATION AT THE ANNUAL MEETING OF THE ADMINISTRATION HELD IN PUEBLO, COLORADO (DEC. 10, 1985)

The purpose of the Compact Administration is to settle disputes between Colorado and Kansas on the Arkansas River and to divide and apportion the waters of the river in an equitable manner.

Any suit brought in the Supreme Court of the United States by one state against another concerning the Arkansas necessarily reflects failure of the Compact Administration and demonstrates a breakdown both of the Administration and the settlement processes that the Administration was created to perform.

Attorney General Stephan reported to the Kansas Legislature that a concerted effort was made in 1984 by Kansas to submit its concerns on the Arkansas River to arbitration with Colorado but that the effort proved fruitless. He stated that there have been three years of efforts to attempt to negotiate, arbitrate or investigate Kansas concerns with Colorado, but, without success, and that he has directed Assistant Attorney General John Campbell and Mr. Simms to prepare the legal documents necessary to initiate litigation against the State of Colorado.

It is my view, from the position to which I have been appointed, that three elements should be necessary to establish a threshold for a suit by one state against another before the Supreme Court of the United States on a compact dispute. If there is a failure of a compact commission to resolve a dispute where the compact had provision for allowing federal representatives a vote (not the case here) or providing for arbitration by federal official (as is the case with this compact) these elements seem appropriate.

First, the underlying factual basis of any dispute should be presented clearly and fully before a regular meeting of the Compact. The claim for relief or the basis for a complaint should be set forth in public and brought before a meeting of the Compact so that the Compact has the opportunity and, indeed, the duty fully to discuss and consider the subject of discord, the claim of injury or damage. The basis of the complaint should be presented at a public meeting and not a closed or informal session or in a committee meeting or in reports not brought to the compact itself.

We have consistently had a large attendance of interested water users and water authorities at the meetings of the Compact Administration. The water community of both states is entitled to hear the complaint of either. Indeed, it is my opinion that the deficiencies in the presentation of problems in the administration of the river and before the general public has caused delays in facing and defining the problems, in solution of these problems, if not exacerbation of the problems themselves. The public is entitled to the airing of the positions of both states and the airing of these problems is the first step towards the solution of the problems. This is a step that may not be ignored or omitted or slighted under the provisions of the Compact as I interpret its purpose and function.

Parliamentary procedures and the fine tuning of resolutions are a necessary part of the functions and deliberations of the Arkansas River Compact Administration, but they are not its principal business. Its principal business is the settlement of disputes, complaints, or grievances or maladministration or claims of injury or damage. These must be identified with specificity and clarity before the Compact Administration if they are to be resolved by the Compact Administration. There is a desire for a temperate and pleasant meeting, but if a suit is in the air, it should come before the Compact prior to being taken to court.

Second, the fact finding process must be pursued to the reasonable limit by both states in order that disputes be resolved. This process has been employed with substantial success and progress by both states in the past year. The Compact has in the past successfully pressed forward on the establishment of facts, a data base, and in resolution of the concerns of both states in the administration of the Arkansas River based upon the factual determinations made. In addition, the Compact has been successful in its special relationships with the agencies of the United States in obtaining studies and reports, some of which have been of great value. I point out particularly the "travel time study" which has become a useful working tool for the administration of the river.

It is not appropriate for me to comment upon or pass judgment upon the deficiences of the fact finding process which appeared in the past few months. If one state refuses to permit fact finding on a practice deemed by the other state to be the cause of great injury, then the process breaks down at that point. This may be the case here. It is appropriate for me to say that both states must make greater efforts to define and to agree upon all of the regime of the Arkansas river and upon the data, the data base, and the facts of operation of the structures in the basin as they may bear upon the regimen and operation of the river and upon the complaints of any state. I believe many of these factual bases have been readily and freely agreed to by the states. In some instances, the facts have been agreed to but we may have fallen short upon the appropriate interpretation of the factual bases.

Third, in the event of the failure to agree between the two states, it is necessary and, indeed, essential that there be an arbitration of the dispute. At the minimum the states should exhaust the arbitration process. The Supreme Court of the United States in Texas vs. New Mexico at 103 S.Ct. 2571 stated that: "Time and again we have counselled States engaged in

litigation with one another before this Court that their dispute 'is one more likely to be wisely solved by cooperative study and by conference and mutual concession on the part of the representatives of the States which are vitally interested than by proceedings in any court however constituted.' " A case given to the Supreme Court from a dispute over an interstate stream almost invariably ends up before a special master who may or may not have the qualifications, expertise, and experience appropriate to determine those matters. The court would acknowledge that there is in regular attendance before this Administration a group of men with skill, judgment, knowledge and experience superior to any other group on the complex issues of the river. The skills and abilities here should be utilized. In any event, before the compact's functions are at an end there must be a genuine effort to resolve disputes by arbitration.

One of the functions of the administration is to refer matters for arbitration. This necessarily involves several steps. One, is the establishment of the ground rules for arbitration of disputes before the Compact Administration. This step has not been taken. Cogent and thorough arbitration procedures have not been submitted by either state for action by the Compact to my knowledge. There have been discussions about arbitration, but I know of no framework which has been established by the Administration.

Next, those matters to be subjected to arbitration must be defined with clarity and precision. The arbitration procedure must run its course. These steps have not been accomplished in my judgment. It is not my intention to frustrate or thwart the remedy of either state, much less to define what those remedies shall be. It is my purpose to set forth those procedures which appear to me clearly to be reasonable and necessary before either successfully claims that its administrative remedies have been exhausted and that it must seek relief outside or beyond the Compact Administration.

APPENDIX B

RESOLUTION OF THE ARKANSAS RIVER COMPACT ADMINISTRATION REGARDING CONTINUED INVESTIGATION OF ALLEGED COMPACT VIOLATIONS SET FORTH IN THE RESOLUTION OF MARCH 28, 1985, AS AMENDED ON JULY 12, 1985

WHEREAS, pursuant to the Resolution of March 28, 1985, an Investigation Committee was constituted to investigate alleged violations of the Arkansas River Compact; and

WHEREAS, in conjunction with existing data and engineering studies the Committee agreed to prepare a series of single and double mass diagrams to analyze preliminarily the regimen of the Arkansas River; and

WHEREAS, the Colorado representative to the Investigation Committee has concluded that further investigation of whether the waters of the Arkansas River have been or are being materially depleted in usable quantity or availability should first examine: 1) reduced diversions by ditches in Colorado Water District 67; 2) the operating plan for John Martin Reservoir; 3) decreased plains precipitation; and 4) soil conservation measures; and

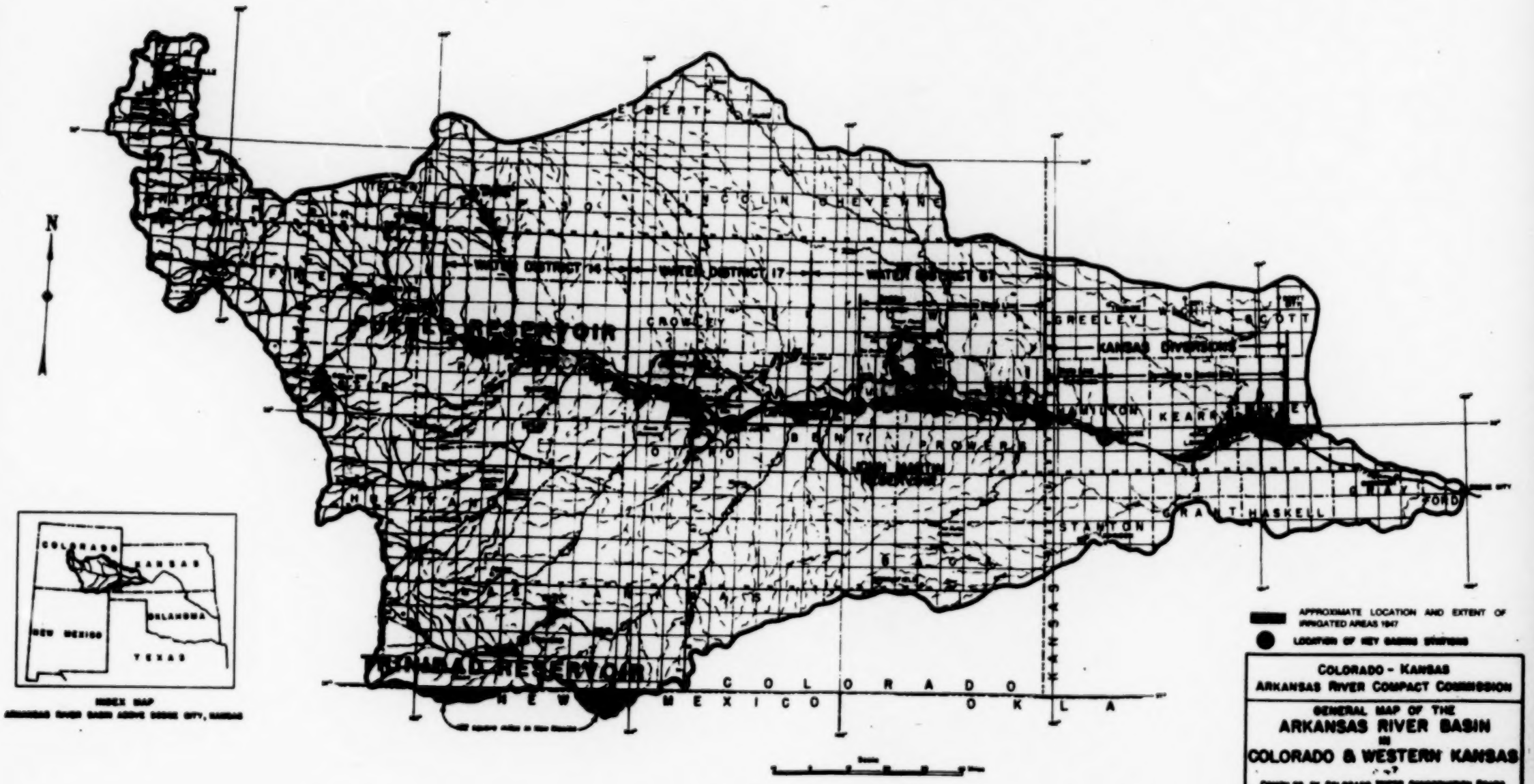
WHEREAS, the Kansas representative to the Investigation Committee has concluded that further investigation of whether the waters of the Arkansas River have been or are being materially depleted in usable quantity or availability should examine: 1) development and use of alluvial wells in Colorado; 2) precompact use of the conservation pool of John Martin Reservoir; 3) transmountain return flows; 4) post-compact development and use of upstream storage reservoirs; 5) tributary inflows and precipitation records; 6) extreme flood events and their impact on streamflow data; 7) surface diversions in Colorado Water Districts 67, 17, and 14; 8) development of stock

ponds in Colorado and their potential impact on tributary inflow to the Arkansas River; 9) the impacts of the 1980 Storage Resolution for John Martin Reservoir on the relationship of usable stateline flows to upstream flows; and 10) tributary inflows from the eastern plains of Colorado;

NOW, THEREFORE, BE IT RESOLVED by the Arkansas River Compact Administration that the Investigation Committee constituted by the Resolution of March 28, 1985, as amended on July 12, 1985, shall continue with its investigation of the matters upon which the Committee has mutually agreed that further investigation should be undertaken.

The foregoing resolution was adopted by the Arkansas River Compact Administration at a special meeting held on October 8, 1985, in Garden City, Kansas.

Frank G. Cooley, Chairman	Leo Idler, Recording Secretary



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(3)

Supreme Court, U.S.
FILED
MAR 3 1986
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No. 105, Original

IN THE

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October Term, 1985

STATE OF KANSAS,
Plaintiff,

v.

STATE OF COLORADO,
Defendant.

MOTION FOR LEAVE TO FILE COMPLAINT OR ALTERNATIVELY TO COMPEL COMPLIANCE WITH ADMINISTRATIVE INVESTIGATION PURSUANT TO ARTICLE VIII(H) OF THE ARKANSAS RIVER COMPACT

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The plaintiff, State of Kansas, pursuant to Rules 9.6 and 28.1, hereby moves for an order granting plaintiff's motion for leave to file its complaint or, in the alternative, granting injunctive relief and an order compelling the defendant, State of Colorado, to comply with Article VIII(H) of the Arkansas River Compact. In support hereof, Kansas states:

1. The Arkansas River Compact was adopted in 1949 by the states of Colorado and Kansas to resolve existing and future controversies and to equitably apportion the waters of the Arkansas River. The Compact was approved and enacted into federal law by the Act of Congress of May 31, 1949, 63 Stat. 145.

2. Article VIII(H) of the Arkansas River Compact provides that:

> Violation of any of the provisions of this Compact or other actions prejudicial thereto which come to the attention of the Administration shall be promptly investigated by it. When deemed advisable as the result of such investigation, the Administration may report its findings and recommendations to the State official who is charged with the administration of water rights for appropriate action . . ..

3. Article VIII(I) provides that "[f]indings of fact made by the Administration shall not be conclusive in any court or before an agency or tribunal, but shall constitute prima facie evidence of the facts found."

4. Article VIII(D) provides that "[e]ach State shall have but one vote in the Administration and every decision, authorization or other action shall require unanimous vote."

5. Article VIII(D) further provides that "[t]he Administration may, by . . . unanimous vote, refer [any matter within the purview of the Administration] for arbitration . . .."

6. Through the actions of its officers, agents and political subdivisions, the State of Colorado and its water users have materially depleted the usable and available stateline flows of the Arkansas River since the adoption of the Compact.

7. The depletions by Colorado of usable stateline flows in violation of Article IV(D) of the Compact have been caused

primarily by the postcompact construction and operation of Trinidad Dam and Reservoir and Pueblo Dam and Reservoir, both of which are situated above John Martin Dam and Reservoir, the conservation structure just above the stateline upon which the Arkansas River Compact was conceptualized, and the proliferation of unregulated alluvial wells along the Arkansas River, essentially all of which are located above John Martin Dam and Reservoir.

8. All previous attempts by the states of Colorado and Kansas to negotiate, investigate, arbitrate, or settle Kansas' allegations of material depletion of stateline flows have been unsuccessful, terminated by Colorado's negative votes.

9. Following an investigation in 1981 of allegations by the State of Kansas that certain administrative practices in Colorado were violating Article IV(D) by materially depleting the usable water available for use in Kansas, the Compact Administration made findings of fact pursuant to Article VIII(H). The Administration's recommendation that the Colorado State Engineer immediately require the release of 18,290 acre feet of water unlawfully stored was defeated by the State of Colorado through its negative vote on the Resolution of January 4, 1982.

10. Through numerous meetings of representatives of the states during 1982, the State of Kansas sought to have various matters submitted to arbitration pursuant to Article VIII(D). At a special meeting of the Arkansas River Compact Administration on March 25, 1983, Kansas sought to submit to arbitration the matters that had been the subject of the Administration's investigation pursuant to Article VIII(H) in 1981. Exercising its prerogative to vote negatively, the State of Colorado refused to submit the matters to arbitration, maintaining that all questions of law and all questions of mixed fact and law were not conducive to arbitration. *See,*

Thirty-Fifth Annual Report, Arkansas River Compact Administration, 78, 85, 87-88 (1983). At the Administration's meeting of March 28, 1985, Colorado representatives expressed the view that the investigatory jurisdiction of the Administration pursuant to Article VIII(H) parallels the arbitration provision in Article VIII(D).

11. On March 28, 1985, after discussion and negotiation of allegations of Compact violations dating back to July 23, 1951, the Arkansas River Compact Administration formally resolved, "in accordance with Article VIII(H) . . . [to] promptly investigate:

> 1. Whether the waters of the Arkansas River have been or are being materially depleted in usable quantity or availability for use to the water users in Colorado and Kansas under the Compact by:
>
> a. the operation of the Trinidad Dam and Reservoir Project, Colorado,
>
> b. the operation of Pueblo Dam and Reservoir, Colorado, and the winter water storage program on the Arkansas River in Colorado,
>
> c. well development of the waters of the Arkansas River in Colorado, and
>
> d. well development of the waters of the Arkansas River in Kansas;
>
> 2. Whether water released from John Martin Dam and Reservoir has been stored in Lake McKinney, Kansas, rather than being applied promptly to beneficial use, without the prior authorization of the Administration; and
>
> 3. Whether there have been increases in ditch diversion rights from the Arkansas River by Kansas ditches between the Stateline and Garden

> City beyond the rights existing at the time of the execution of the Compact, which increases have occurred without the Administration first making findings of fact that the usable quantity and availability for use of the waters of the Arkansas River to water users in Colorado Water District 67 and Kansas would not be thereby materially depleted or adversely affected."

12. Notwithstanding the resolution of March 28, 1985, to conduct an administrative investigation of the enumerated allegations, Colorado took the position through its negative votes on six other resolutions proposed by Kansas that only the issue of alluvial well depletion was "subject and appropriate to arbitration pursuant to Article VIII(D) of the Arkansas River Compact."

13. Most of Colorado's depletion of usable stateline flows in violation of Article IV(D) results from diversions from unregulated, postcompact alluvial wells. For decades Colorado allowed the proliferation of unregulated wells in the Arkansas Valley, ignoring the adverse effects on surface water users, and refused to address the problem by curtailment and regulation of wells. *See, e.g.*, Hillhouse, "Survey of Colrado Water Law," 47 Denver L. J. 226 (1970); Comment, "Appropriation and Colorado's Ground Water: A Continuing Dilemma?", 40 U. Colo. L. Rev. 133 (1967); Hillhouse, "Ground and Surface Water In An Appropriation State," 20 Rocky Mountain Min. L. Inst. 691 (1975).

14. On October 4, 1985, after avoiding the command of the Administration's Resolution of March 28, 1985, to "promptly investigate . . . well development in Colorado," Colorado refused "at this time, . . . to undertake an investigation into well development in Colorado . . .." Memorandum from J. William McDonald, Colorado's representative on the

Investigation Committee, to the Arkansas River Compact Administration.

15. While Colorado has refused to participate in a prompt, bilateral investigation of depletions caused by well development in Colorado, as required by Article VIII(H), the Colorado legislature has funded and the Colorado water agencies have undertaken a unilateral investigation of the well development, and Colorado refused to make the information compiled for its study available to the Compact Administration.

16. Colorado has refused to consider the investigation of Kansas' allegations of Compact violation in regard to the operation of Trinidad Reservoir and the operation of Pueblo Reservoir.

17. Following an investigation of depletions of stateline flows using an engineering methodology which was mutually agreed could not identify or isolate the causes of indicated depletions, Kansas proposed the continued investigation of all of the allegations enumerated in the Resolution of March 28, 1985, which were to have been promptly investigated pursuant to Article VIII(H). Colorado refused to investigate the allegations and by Resolution of October 8, 1985, agreed to continue the investigation in four limited areas of potential depletion below John Martin Reservoir. Kansas' allegations of depletion in violation of Article IV(D) of the Compact relate almost exclusively to uses of water in Colorado above John Martin Reservoir.

18. On December 10, 1985, the State of Kansas sought for the third time to have Colorado cooperate in an investigation of its allegations as initially agreed to in the Administration's Resolution of March 28, 1985. Kansas moved that the Arkansas River Compact Administration:

> (1) . . . [R]equire the State of Colorado to furnish to the State of Kansas all information,

records and data concerning alluvial well development in the Arkansas River basin, including the number and location of wells, annual quantities and rates of diversion, authorized number of acres irrigated, types and acres of crops irrigated and all other water use data available;

(2) immediately undertake an investigation of the impact of postcompact well development and water use in the State of Colorado on the usable stateline flow of the Arkansas River and on the State of Kansas' equitable apportionment of the waters of the Arkansas River under the Compact;

(3) recommend to the Colorado State Engineer that he terminate all postcompact well uses in the Arkansas River Basin of Colorado during the pendency of the Compact Administration's investigation of postcompact well development;

(4) immediately undertake an investigation of the impact of past rollover of water in Trinidad Reservoir on the usable stateline flow of the Arkansas River and on the State of Kansas' equitable apportionment of the waters of the Arkansas River under the Compact;

(5) require the State of Colorado to adhere to and act in accordance with the Compact Administration's Resolution of July 24, 1951, concerning reregulation, if any, of native waters of the Arkansas River in connection with Colorado's transmountain diversion under the Gunnison-Arkansas River Project; and

(6) require the State of Colorado to provide to the Compact Administration's Investigation Committee its data, calculations and studies regarding use and depletion of its transmountain diversions in the Arkansas River Basin and to cooperate with

> the State of Kansas in quantifying the amount of Colorado's transmountain return flow to the Arkansas River.

Colorado voted negatively, refusing again to investigate Kansas' allegations and precluding the Arkansas River Compact Administration from taking any meaningful action.

19. In light of Colorado's refusal to abide by the Administration's Resolution of March 28, 1985, to investigate Kansas' allegations of Compact violation, this suit was filed on December 16, 1985.

20. Colorado's continuing refusal to cooperate renders the administrative investigation ineffective and purposeless.

21. Compounding the fact that Colorado has rendered the administrative investigation ineffective and purposeless, Article VIII(H) provides only for discretionary recommendations, leaving the State of Kansas' remedy subject to the negative votes of the State of Colorado.

WHEREFORE, the State of Kansas prays:

1) That the Court grant Kansas' motion for leave to file its complaint or, in the alternative, that the Court order the State of Colorado to comply with Article VIII(H) of the Arkansas River Compact and the Arkansas River Compact Administration's Resolution of March 28, 1985, to promptly investigate all of Kansas' allegations of Compact violation;

2) that the Court enjoin all postcompact well uses in the Arkansas River Valley pending the completion of the Administration's investigation within a time certain; and

3) that the Court retain jurisdiction of this action pend-

ing the expeditious completion of the investigation by the Arkansas River Compact Administration.

Respectfully submitted,

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CERTIFICATE OF SERVICE

Pursuant to Rules 42(5) and 33 of the Supreme Court Rules, I certify that three copies of the foregoing motion were served upon counsel of record on March 3, 1986.



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INTRODUCTION

Colorado has responded to Kansas' motion for leave to file its complaint by explaining that "Kansas has not made a reasonable effort to resolve this matter [administratively]" and by arguing that "Kansas has an adequate means for vindicating its concerns through a pending investigation by the

[Arkansas River Compact] Administration." Colorado's Brief in Opposition at 1. Based on the facts as related by Colorado, Colorado's position clearly comports with the principle that the Court will not entertain an otherwise justiciable action between states when an alternative forum or administrative remedy is available to the plaintiff state. *See, e.g., Massachusetts v. Missouri,* 308 U.S. 1, 19-20 (1939). Colorado, however, has not recited the essential facts, has dissembled those it did recite, and would mislead the Court into a decision to decline jurisdiction. The object of the reply is to relate the relevant facts, to apply them to the principle of administrative exhaustion, to reveal the unctuousness of Colorado's opposition to Kansas' motion for leave to file its complaint, and to support Kansas' alternative motion to compel compliance with the Arkansas River Compact Administration's Resolution of March 28, 1985, made pursuant to Article VIII(H) of the Compact.

STATEMENT OF FACTS

Colorado divides its statement of facts into two parts, those relating to the administrative investigation which was conducted pursuant to the Resolution of March 28, 1985, and "background facts" relating to the history of Colorado's regulation of ground water. With regard to the administrative investigation, Colorado imparts the spurious view that the committee functioned harmoniously since April, 1985, "to determine if there had been any changes in the relationship between streamflows at selected locations in the Arkansas River Basin." Brief in Opposition at 4. Colorado also suggests that Kansas' amendment on July 12, 1985 of the Resolution of March 28, 1985, interrupted the investigatory process and raised new issues. Colorado then explains that "extensive reports" were submitted and that the "Administration expressly authorized the committee to 'continue with its investigation of the matters upon

which the Committee has mutually agreed that further investigation should be undertaken,' " suggesting to the Court that the resolution reaffirmed that the administrative investigation was operating smoothly and it should continue.[1] *Id.*

In contrast to this sanguine picture, Colorado juxtaposes the Kansas Attorney General's announcement that suit would be filed on December 16, 1985, suggesting that his ostensibly maverick actions differ sharply from the prudent course sought to be followed by the Arkansas River Compact Administration.

ADMINISTRATION OF COLORADO WATER LAW

With regard to the "background facts," Colorado explains that the Colorado State Engineer was justified in believing that he had no authority prior to 1965 to regulate ground water diversions and that in 1965 the Colorado legislature acted expeditiously to provide the State Engineer with "clear" authority. Armed with this newfound authority, according to Colorado, the State Engineer promptly set out to curtail the use of alluvial wells along the Arkansas River. Despite the good intentions of the State Engineer, however, the Colorado Supreme Court found his regulatory effort unconstitutional, which motivated immediate action by the legislature to investigate the need for legislation which would accommodate

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[1] Contrary to Colorado's assertion, the United States' Representative to the Compact Administration did not conclude that Kansas has not followed administrative procedures. Indeed, Colorado takes the language it quotes out of the context of arbitration, not administrative investigation. As to the latter, the United States' Representative stated that "[i]f one state refuses to permit fact finding on a practice deemed by the other state to be the cause of great injury, then the process breaks down at that point. This may be the case here." *See,* Minutes of Annual Meeting of the Arkansas River Compact Administration, December 10, 1985 at 69.

the integrated administration of surface and ground water. This investigation, according to Colorado, resulted in the enactment of the Water Rights Determination and Administration Act of 1969, which in turn led to the promulgation in 1972 of rules and regulations to curtail ground water uses in the Arkansas River Valley. Additionally, according to Colorado, the State Engineer proposed an amendment in 1974 to further curtail ground water uses, which was rejected by the Colorado Supreme Court. According to Colorado, its Supreme Court determined that there was no substance to the contention that ground water diversions had depleted the flows of the Arkansas River.

There is a grain of truth in everything Colorado has said, almost. The actual history of Colorado's regulation of ground water diversions explains its refusal to consider the adverse effects of postcompact well development on stateline flows.

For decades Colorado allowed the proliferation of unregulated wells in the Arkansas Valley, ignoring the inevitable effect on surface water users. *See, Survey of Colorado Water Law,* 47 Denver L.J. 226, 322-24 (1970); Hillhouse, *Ground and Surface Water In An Appropriation State,* 20 Rocky Mtn. Min.L.Inst. 691, 696-97 (1975). Colorado refused to address the problem, fearing that agricultural interests would be hurt by any curtailment or regulation of wells. *See, Survey of Colorado Water Law,* 47 Denver L.J. at 323; Hillhouse, 20 Rocky Mtn.Min.L.Inst. at 697. The Colorado Legislative Council was outspoken about the fact that political pressure was the true reason that nothing was done to curtail the well development. *See, Implementation of 1965 Water Legislation XXV,* Research Pub. No. 114 (1966).

Despite the fact that the State Engineer had unequivocal authority to regulate wells, he used the alleged lack of authority as an excuse to avoid a sensitive political issue and took no

action.[2] The result was a staggering increase in the number of wells, as irrigators "rush[ed] to board Colorado's underground

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[2] If no other relevant law existed in Colorado, the Arkansas River Compact, Colo. Rev. Stat. Section 149-9-1 (1963), provided all the authority the State Engineer needed to prevent the depletion of surface flows by ground water diversions. *See,* Report of the Special Master, *Texas v. New Mexico,* 446 U.S. 540 (1979); *Hinderlider v. La Plata and Cherry Creek Ditch Co.,* 304 U.S. 92 (1938).

There were other existing laws, however. In *Fellhauer v. People,* 447 P.2d 986 (Colo. 1968), the first well curtailment case on the Arkansas River, the Colorado Attorney General and the intervening Arkansas surface water users took the position that the State Engineer had had the authority to regulate wells long before the 1965 act which ostensibly provided the necessary authority for the first time. Strongly hinting its agreement with this view, the Colorado Supreme Court quoted Benjamin F. Stapleton, Jr., the chairman of the Colorado Water Conservation Board:

> * * * House Bill 1066 [the 1965 act], merely gave the State Engineer the right to shut down wells. House Bill 1066 was, in my opinion, superfluous since the State Engineer had not only the right but the responsibility under then-existing laws to shut down wells which were interfering with the prior rights of other water users. The State Engineer insisted that he had no authority and to force the State Engineer to take action on these matters existing laws were amended to make what was already crystal clear even more self-evident by specific command to the State Engineer to take action against well owners in the operation and management of the total water resources of the state.
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> * * * * * * *
>
> I have always believed that the State Engineer had the authority to shut down wells if they were interfering with the rights of senior appropriators and yet, because shutting down a well is always controversial, no action was taken by the State Engineer, acting on the excuse that he had no authority under state laws.

Id. at 990.

Cont. p. 6

waterwagon." Comment, *Appropriation and Colorado's Ground Water: A Continuing Dilemma?*, 40 U.Colo.L.Rev. 133, 134-36 (1967).

In 1965, after nearly twenty years of well development which had been ignored by the State of Colorado, numerous Arkansas River Ditch Associations petitioned the State Engineer, demanding well diversions be curtailed in order to stop

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Footnote 2, Cont.

The existing law Chairman Stapleton was referring to was Article XVI, Section 5 of the Colorado Constitution, which provides that all ground water is presumed tributary to surface flow, and a conspicuous body of case law standing for the proposition that the doctrine of prior appropriation applies to tributary groundwater. *See, e.g., Colorado Springs v. Bender,* 148 Colo. 458, 461-62, 366 P.2d 552, 555 (1961); *Black v. Taylor,* 128 Colo. 449, 459, 264 P.2d 502, 507 (1953); *Safranek v. Town of Limon,* 123 Colo. 334, 228 P.2d 975, 977 (1951); *De Haas v. Benesch,* 116 Colo. 344, 350-51, 181 P.2d 453, 456 (1947); *Lomas v. Webster,* 109 Colo. 107, 110, 122 P.2d 248, 250 (1942); *Dalpez v. Nix,* 96 Colo. 540, 549, 45 P.2d 176, 180 (1935); *Faden v. Hubbell,* 93 Colo. 358, 369, 28 P.2d 247, 251 (1933); *Nevius v. Smith,* 86 Colo. 178, 182, 279 P. 44, 45 (1929); *Comrie v. Sweet,* 75 Colo. 199, 201, 225 P. 214, 215 (1924); *Ft. Morgan Reservoir & Irr. Co. v. McCune,* 71 Colo. 256, 206 P. 393, 394 (1922); *Rio Grande Reservoir & Ditch Co. v. Wagon Wheel Gap Improvement Co.,* 68 Colo. 437, 444, 191 P. 129, 131 (1920); *Trowel Land & Irr. Co. v. Bijou Irr. Dist.,* 65 Colo. 202, 216, 176 P. 292, 296 (1918); *Durkee Ditch Co. v. Means,* 63 Colo. 6, 8, 164 P. 503, 504 (1917); *Comstock v. Ramsay,* 55 Colo. 244, 255-56, 133 P. 1107, 1110 (1913); *La Jara Creamery & Live Stock Ass'n. v. Hansen,* 35 Colo. 105, 109, 83 P. 644, 645 (1905); *Ogilvy Irrigating & Land Co. v. Insinger,* 19 Colo. App. 380, 386-87, 75 P. 598, 599 (1904); *Buckers Irr., Mill. & Imp. Co. v. Farmers' Independent Ditch Co.,* 31 Colo. 62, 71, 72 P. 49, 52 (1902); *Platte Valley Irr. Co. v. Buckers Irr., Mill. & Imp. Co.,* 25 Colo. 77, 82, 53 P. 334, 336 (1898); *Bruening v. Dorr,* 23 Colo. 195, 197-98, 47 P. 290, 292 (1896); *McClellan v. Hurdle,* 3 Colo. App. 430, 33 P. 280 (1893).

depletions of surface flows. Following the State Engineer's refusal to act, H. B. 1066 was enacted in 1965 to force the State Engineer to "execute and administer the laws of the state relative to the distribution of the surface waters of the state including the underground waters tributary thereto in accordance with the right of priority of appropriation." Colo. Rev. Stat. Section 148-11-22(1) (Supp. 1965); *see also, Proceedings of the Joint Session* 1-8, Mineral Law & Water Law Sections, Colorado Bar Assoc. (October 15, 1966).

The long overdue legislation was not popular with farmers:

> [I]n the absence of any other specific statutory language prior to 1965, individual farmers in Colorado invested thousands of dollars in developing underground water as a source of supply for their crops. It is no wonder, then, that . . . House Bill No. 1066 . . . was considered as a threat to their personal livelihood and a taking of their property without due process of law . . .. [I]t is not surprising that many persons view the . . . action in 1965 with deep-felt bitterness and resentment, when the main thing wrong with this legislation is that it was enacted some 20 or 30 years later than it should have been.

47 Denver L.J. at 323.

As of 1967 the State Engineer still had not promulgated any rules and regulations. In a forthright decision in 1967, the district court enjoined one farmer, Roger Fellhauer, from pumping his alluvial wells because there was no unappropriated water in the Arkansas system. Concerned with the district court's decision and fearing that it may have gone dangerously far toward actual priority administration in H. B. 1066, the legislature passed S. 407 in 1967, while *Fellhauer* was pending appeal. The new legislation called for an investigation of well

depletion and an evaluation of additional legislation.[3] *See*, 47 Colo. L. Rev. at 327-28. Shortly thereafter, Roger Fellhauer persuaded the Colorado Supreme Court that H. B. 1066 was unconstitutional. *See, Fellhauer v. People*, 447 P.2d 986 (Colo. 1968).

Based on this spotted history "[t]he National Water Commission found Colorado's experience in dealing with physically integrated ground and surface waters a persuasive argument why other states should develop legal systems providing for their coordinated administration as soon as possible." Hillhouse, 20 Rocky Mtn.Min.L.Inst. at 691, *quoting* National Water Commission, *Water Policies for the Future* 233, Final Report to the President and to the Congress of the United States (1973).

Against this background, Colorado's refusal to even consider Kansas' claim that the wells in the Arkansas Valley are depleting stateline surface flows demonstrates Colorado's attempt to bury a problem that has plagued the state for decades. While Colorado would have the Court believe that well depletion is imaginary, it is in fact very real, and Colorado's refusal to

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[3] In its Brief in Opposition , Colorado cites one of the studies done pursuant to S. 407, *i.e.*, W. W. Wheeler and Associates and Woodward – Clyde & Associates, *Water Legislation Investigations for the Arkansas River Basin in Colorado* (1968). Brief in Opposition at 5. There was no apparent reason for Colorado's reference to the study, especially in light of its principal conclusion that "[t]he use of wells in recent years has materially decreased the surface flow available to direct flow and storage rights." *See*, Vol. I, Summary Report at 3.

consider it exemplifies its desire to confound any meaningful investigation by the Arkansas River Administration.[4]

ADMINISTRATIVE INVESTIGATION OF DEPLETIONS OF SURFACE FLOWS BY WELLS

Colorado's explanation of the history and the efficacy of the Compact Administration's investigation pursuant to Article VIII(H) and the Resolution of March 28, 1985, is equally disingenuous.

First, Colorado states that:

> Kansas admits, however, that the well development of which it complains occurred almost exclusively *prior to 1965.* Nevertheless, and despite its allegation that since 1974 there has been a substantial decrease in usable stateline flows, it was not until March 28, 1985, that Kansas *for the first time,* requested the Administration to investigate whether well development in Colorado had caused material depletion to the waters of the Arkansas River. The Kansas brief implies that well development in Colorado had been the subject of discussion by the Administration for several years . . ..

Brief in Opposition at 9-10 (citations omitted) (emphasis in original).

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[4] In 1966 there was insufficient Arkansas River water to satisfy 1887 priorities. In the Colorado State Engineer's valiant effort to remedy the problem, he sought to enjoin 39 out of some 2,000 wells in only two of Colorado's 13 water districts. The Division Engineer on the Arkansas River didn't mince words when he described the lack of enthusiasm; all of the valley wells were not shut down "because you are going to affect the economy of the valley." *Fellhauer,* 447 P.2d at 992.

The implication Colorado offers the Court is that Kansas has sat on its hands, idly watching the stateline flows decline over the years.[5]

The actual history is quite the contrary. As early as its meeting on December 11, 1956, "[t]he Administration held considerable discussion concerning the activity of well drilling and its effect on conditions." *Minutes of Annual Meeting,* December 11, 1956 at 15. Since then, well depletion has been discussed, both formally and informally, at numerous meetings of the Compact Administration. On April 23, 1977, Mr. Harry Bates, a member of the Buffalo Mutual Irrigation Co. and Colorado's Compact Administration representative from District 67, submitted a memorandum to the Arkansas River Compact Administration regarding "problems concerning storage in John Martin Reservoir."[6] After noting that "the most recent 10 year average shows a decline of over 54,000 a.ft. [in storage] from that of the first 10 years of Compact operation, Mr. Bates reported "that the most probable causes are as follows:

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[5] Even Colorado agrees that the stateline flows "declined substantially" beginning in 1974. *See,* J. W. McDonald, *Report to Investigation Committee of the Arkansas River Compact Administration* (September 6, 1985). The most recent study of depletions in Colorado of stateline flows concludes that "[s]treamflow at the Kansas stateline has been reduced significantly since 1949 due to increased consumption of water in Colorado" and "[a]ctual and usable streamflows at the stateline during the period 1974 to 1983 are significantly less than those that occurred during the pre-compact period and during the post-compact period up to 1974." S. S. Papadopulos & Associates, Inc., *Status Report on Evaluations of Streamflow Depletions Along the Arkansas River* (February 17, 1986).

[6] District 67 is the area below John Martin Reservoir, encompassing the water uses in the 60 miles stretch to the stateline. Because of the location of the District, its interests are often the same as those of Kansas.

> 1. Heavy increase in winter irrigation during the months of November thru March by water users in Colorado Water Districts 14 and 17 upstream from John Martin Dam.
>
> 2. A proliferation of wells pumping from the aquifer hydraulically connected to the live river stream above John Martin.
>
> 3. Transfer of some water rights from agricultural use to municipal and industrial use.
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> 4. Recently, a re-regulation of river flow by Pueblo Reservoir. This re-regulation will be amplified by operation of the Trinidad Dam.
>
> 5. Increase in phreatophyrtic growth along the river.
>
> 6. Less run-off because of increase in contour terracing, stock water ponds, range land pitting, and other conservation practices."

Id. at 1-2.

Quantitatively, the most significant depletion resulted from ground water diversions. *Minutes of Annual Meeting,* December 12, 1978, at 11-12.[7]

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[7] In his memorandum, Mr. Bates recognized that he was confronting upstream Colorado users, but nevertheless recommended that the Administration investigate the problem. He was replaced on August 16, 1977.

While Mr. Bates was outspoken, he was not alone. In the 1960's, Colorado farmers like Frank Milenski, one of the valley's pre-eminent experts on the history of water use, lobbied state politicians to curb the drilling of wells, which in effect gave relative newcomers along the river access to his 19th century water right. Kansas City Star, February 23, 1986, at 14A.

While the issue of well depletions was discussed with growing frequency in the 1970s, this issue and others were the subject of many meetings and exchanges of correspondence between engineers and the Attorneys General of the respective states. These discussions were cited in Attorney General Stephans' letter of February 26, 1985 to Colorado Attorney General Duane Woodard:

> You will recall that in the late 1970s certain administrative practices above John Martin Reservoir in Colorado generated considerable concern on the part of the Kansas delegation to the Arkansas River Compact Administration. Numerous special and regular meetings of the Administration were devoted to discussion of the problems, but essentially no progress was made toward their resolution. On August 31, 1982, your predecessor and I met with the agency and compact officials to further clarify the issues that had stalemated the Administration. Our participation, however, was not particularly fruitful. While the Administration meetings continued to conclude with an exchange of negative votes on the respective delegations' attempts to resolve the issues, we recited the states' positions in a protracted exchange of correspondence. The discussions ended with an unsuccessful attempt by Kansas to initiate arbitration pursuant to Article VIII(D) of the Compact.

Having been repeatedly discouraged over the years by the State of Colorado's proven disinclination either to acknowledge or to do anything about the continuing depletions of surface flows by wells, the State of Kansas contracted with Simons, Li & Associates, Inc. on September 26, 1983 to study the depletions in relation to Colorado's obligations under the

Arkansas River Compact. Noting that "[w]ell depletions in Colorado have been estimated to be from 150,000 to 200,000 acre-feet per year, according to the Colorado State Engineer and others," Simons, Li & Associates concluded that "[s]ince 1974 . . . usable flows have declined to about 45 percent of pre-compact values . . . [and] well development in Colorado has caused approximately 150,000 acre-feet per year of depletions to the Arkansas River." *Preliminary Assessment – Development and Administration of Water Resources of the Arkansas River* at iv.

While Colorado's suggestion to the Court "that well development in Colorado had [not] been the subject of discussion by the Administration [in previous] years" is belied by the history, its factual assertion that "[t]he Colorado representatives did not refuse to investigate the substance of the Kansas allegation concerning well development in Colorado" is flatly wrong. Brief in Opposition at 10-11.

To support its statement, Colorado claims the issue is "what to investigate first," and blithely concludes that only changes in plains precipitation need be investigated. Its "conclusion" that declines in eastern plains precipitation are the cause of the declines in usable stateline flows derives from the Investigation Committee's use of a technique called "mass diagram analysis." Mass analysis is useful in determining trends over long periods of time, but "it should be emphasized," in Colorado's words, that:

> . . . they do not explain the reasons for trends or changes in the relationship between two sets of streamflow data. Such changes may be due to inherent variability of hydrologic data, changes in record-keeping methods, or many other factors. Likewise, the mere fact that there is no change in the relationship between two sets of streamflow data does not necessarily mean that

> no real change in the relationship has occurred or that there is a causal connection between the two sets of data.

J. W. McDonald, [Colorado's] *Report to Investigation Committee of the Arkansas River Compact Administration* 1 (September 6, 1985).

Despite the agreement of Kansas and Colorado that causes of declines in flows cannot be identified or isolated by the technique, Colorado concluded that the decline in flows shown by the Investigation Committee's mass analysis "was directly related to a decline in tributary inflow from plains drainage areas . . .." J. W. McDonald, *Memorandum to Arkansas River Compact Administration* (October 4, 1985) at 19.

It is clear that Colorado's attempt to isolate the causes of depletions in stateline flows and to restrict the administrative investigation to those causes cannot be justified. When this precise issue was addressed by recognized experts, it was concluded that postcompact well development in Colorado has unquestionably materially depleted the Arkansas River and that Colorado's purposeful attempt to avoid study of well depletions is not remotely justifiable on the basis of any hydrologic or engineering reason. *See,* S. S. Papadopulos & Associates, Inc., *Report to the Arkansas River Compact Administration Regarding the Article VIII(H) Investigation of Alleged Violations of the Arkansas River Compact* (December 6, 1985). If the Administration's investigation is to be meaningful, all possible causes of depletion to stateline flows must be investigated.

Aside from sound engineering practice, the language of the Compact in regard to administrative investigations is unambiguous and mandatory: "Violation of any of the provisions of this Compact . . . which come to the attention of the Administration shall be promptly investigated by it." Article VIII(H).

Notwithstanding the mandate of the Compact, Colorado refused to proceed to investigate depletions by wells and five other areas in the Resolution of October 8, 1985.[8] That resolution was *not* a bilateral affirmation that the investigation should proceed, but rather a unilateral rejection of the investigation in essentially all of the areas deemed crucial by the State of Kansas.

KANSAS' OTHER ALLEGATIONS OF MATERIAL DEPLETION

Colorado has also maintained that "[o]ther matters raised by Kansas do not justify an original forum in this Court." Brief in Opposition at 17. The other matters are: 1) the operation of Trinidad Reservoir; 2) Colorado's refusal to quantify transmountain return flows, and 3) Colorado's refusal to abide by the Resolution of July 24, 1951. While Colorado refuses to consider these matters, Kansas has maintained that they must be investigated.

With regard to Trinidad, the matter was initially investigated in 1981, and the Administration's recommendation that the Colorado State Engineer immediately release 18,290 acre feet of water unlawfully stored was defeated by Colorado's negative vote on the Resolution of January 4, 1982. The same issue is

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[8] Anomalously, while Colorado has refused to participate in a prompt, bilateral investigation of depletions caused by well development in Colorado, as required by Article VIII(H), the Colorado legislature has funded and the Colorado water agencies have undertaken a unilateral investigation of the well development, refusing to make the information compiled for its study available to the Compact Administration.

Colorado has also expressed an interest in investigating alleged depletions of surface flows by wells in Kansas. In other words, Kansas wells deplete the flow of the river but Colorado wells don't.

being addressed by the U.S. Bureau of Reclamation now, and the Bureau has agreed with Kansas that Colorado has stored large amounts of water in Trinidad in violation of the Reservoir's Operating Principles. Colorado's statement that "Kansas has adequate means to address its concerns . . . through the review process being conducted by the . . . Bureau" is incorrect. The Bureau has no power to force Colorado to vote affirmatively.

Transmountain return flows present another sensitive issue. Colorado admits that it refuses to investigate transmountain return flows, but characterizes the issue as "a hypothetical controversy which is not ripe for adjudication." Brief in Opposition at 19. Return flows need to be investigated, however, for two reasons. First, in all of the mass analyses that have been performed, the transmountain water in the Arkansas River has been arithmetically removed from the upstream gages, while the return flows, as a matter of fact, contribute to the regimen of the river and have not been quantified and arithmetically removed from the downstream gages. The result is that the actual depletion of stateline flows is greater than shown by the administrative investigation by the amount of the returns. Secondly, Colorado refuses to quantify the returns because they may be fully consumed by the importer under Colorado law. Kansas is interested in preventing any further consumption of the returns because they represent wet water that could be used to offset Colorado's failure to meet its Compact obligations.[9]

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[9] The real reason Colorado refuses to cooperate is to buy the time needed for its courts to approve programs of return flow utilization. *See, e.g.*, the Application of Colorado Springs in Water Division No. 2, No. 84-CW-179. The object is to sanction the programs with court decrees, thus adding the inertia thought sufficient to prevent this Court from awarding the water to Kansas in lieu of interfering with the economy derived from well pumping.

With regard to Colorado's refusal to abide by the Administration's Resolution of July 24, 1951, Colorado tries to explain that "the resolution expressed [only] a policy . . . that there be no reregulation of native waters of the Arkansas River . . . until a plan of operation had been submitted to and approved by the Administration." Brief in Opposition at 19. The resolution, however, was the consideration for Kansas' approval of the Gunnison-Arkansas Project, its object being to assure that any reregulation of native water in Arkansas River storage structures would not undermine the mutual rights and obligations set out in the Compact. *See, e.g.*, Senate Report No. 1742, 87th Congress, 2d Sess., July 19, 1962. The federal representative to the Compact Administration agrees with Kansas and with Congress that reregulation "require[s] consideration by the Compact Administration." F. G. Cooley, Letter to the Arkansas River Compact Administration (January 14, 1985).

ARGUMENT

In the Court's second decision in *Texas v. New Mexico*, 462 U.S. 554 (1983), it was recognized that when an interstate compact commission is not able to act, the dispute will be considered by the Court.[10] This is consistent with the rule

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[10] The doctrine of primary jurisdiction does not apply to this case. That doctrine is concerned with placement of a case in the proper initial forum. *See, United States v. Western Pacific R. Co.*, 352 U.S. 59 (1956). Here, it is undisputed that the Administration is the proper initial forum. The dispute is whether, in light of Colorado's unjustified refusal to investigate all of Kansas' allegations, the case should continue in that forum. That is an administrative exhaustion issue.

The doctrine of primary jurisdiction does not apply for another reason. As *Texas & Pacific Railway v. Abilene Cotton Oil Co.*, 204 U.S. 426 (1907) demonstrates, an underlying assumption of the doctrine is that the administrative agency is able to act, render a decision, and award

Cont. p. 18

that a litigant need not resort to administrative remedies when they would be futile. *See, Moore v. East Cleveland,* 431 U.S. 526 (1977) (dissenting opinion); *see also, Aleknagik Natives v. Andrus,* 648 F.2d 496 (9th Cir. 1980). Nor has the Court required administrative exhaustion if administrative relief is inadequate. *Aircraft & Diesel Corp. v. Hirsch,* 331 U.S. 752 (1947). Administrative relief may be inadequate if, although it is adequate in theory, it is not available in practice. *See, McNeese v. Board of Education,* 373 U.S. 668 (1963). If the Court finds that awaiting the agency decision would "put aside substance for needless ceremony," administrative exhaustion will not be required. *Smith v. Ill. Bell Tel. Co.,* 270 U.S. 587 (1926).

As the actual history of Compact administration and investigation demonstrates, Kansas has attempted to invoke and exhaust all potential administrative remedies. The problem has been Colorado's refusal to heed the mandate of Article VIII(H) and to cooperate in a meaningful way. In this regard, the State of Kansas is still willing to participate in a continued administrative investigation, but only if Colorado is compelled "to promptly investigate" all of Kansas' allegations of compact violation.

In 1980, the Court amended Rule 9 to expressly provide that it is free with respect to a motion for leave to file to "grant or deny the motion, set it down for argument, *or take other appropriate action.*" Moore, *Federal Practice,* Paragraph 809.05 (emphasis added). Kansas suggests that appropriate action would be an order compelling Colorado to promptly

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Footnote 10, Cont.

the relief sought. In *Texas & Pacific,* the Interstate Commerce Commission was able to impartially consider all evidence and bring the case to a final conclusion. In this case the Administration has not been able to do so.

investigate all of Kansas' allegations. Without the help of the Court, a continued administrative investigation would be futile.

CONCLUSION

Colorado has not only refused to investigate Kansas' allegations of Compact violation pursuant to Article VIII(H) and the Resolution of March 28, 1986, but has also argued that "there is little likelihood of injury to Kansas" by further delay because John Martin Reservoir is full. Colorado, however, has gotten away with the explanation that less is more for many years. John Martin Reservoir has spilled only twice in thirty years. The result of Colorado's postcompact depletions has been to deprive Kansas of the renewable surface resource and force it to tap the nonrenewable ground water resources of the Ogallala aquifer. *Cf., Sporhase v. Nebraska,* 458 U.S. 941, 953 (1982). The injury is both ongoing and obvious.

Colorado has also tried to leave the Court with the impression that it would continue the administrative investigation in good faith. Experience has shown the contrary. When Kansas sought to submit matters relating to the operation of Trinidad Reservoir to arbitration, Colorado refused, stating that it "would prefer that Kansas sue" and that "Colorado was set up to sue and be sued, not arbitrate." *See,* attached Affidavit of Carl Bentrup, Commissioner on the Arkansas River Compact Administration.

Kansas respectfully requests that Colorado be compelled to comply with the Resolution of March 28, 1985, or that the

Court grant the motion for leave to file so that Kansas might pursue its only effective remedy.

Respectfully submitted,

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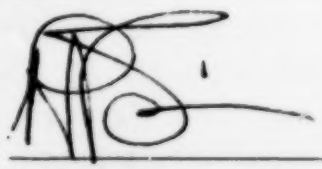
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CERTIFICATE OF SERVICE

Pursuant to Rules 28(5) of the Supreme Court Rules, I certify that three copies of the foregoing Reply Brief and Brief in Support of Motion for Leave to File Complaint or Alternatively to Compel Compliance with Administrative Investigation Pursuant to Article VIII(H) of the Arkansas River Compact were served on March 4th, 1986 on:

David W. Robbins
Hill & Robbins
1441 Eighteenth Street, Suite 100
Denver, Colorado 80202



RICHARD A. SIMMS
Special Assistant Attorney General
Counsel of Record

AFFIDAVIT

State of Texas)
) ss
County of Taylor)

I, Carl Bentrup, being first duly sworn, upon oath state:

1. That I have been a commissioner on the Arkansas River Compact Administration since June 7, 1957.

2. That on March 25, 1983, I attended a meeting of the Legal and Administration committee of the Arkansas River Compact Administration in Garden City, Kansas. At the December 14, 1982, annual meeting of the Arkansas River Compact Administration, both states had agreed to prepare procedures for arbitration.

3. At the direction of the Kansas Delegation, Mr. John Campbell, Assistant Attorney General for the State of Kansas, had prepared proposed rules of arbitration which he had submitted to the committee for discussion purposes. The State of Colorado had not developed any proposed rules for arbitration for discussion purposes. Mr. McDonald, a Colorado commissioner of the Arkansas River Compact administration, criticized a number of the proposals prepared by Mr. Campbell. Finally, Mr. McDonald left, went to the phone and called the Colorado attorney general. When he returned, he said he had spoken with the attorney general and that Colorado could see no problem that Colorado would be willing to arbitrate. He said Colorado would prefer that Kansas sue them.

Mr. McDonald said that Colorado was set up to sue and be sued, not arbitrate.

Further, affiant sayeth naught.

Dated this 28th day of February, 1986.

/s/ Carl Bentrup

Carl Bentrup, Commissioner
Arkansas River Compact Commission

Subscribed and sworn to before me this 28th day of February, 1986.

/s/ Karen S. Daniels
Notary Public

My Commission Expires 11-20-88 .

Supreme Court, U.S.
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No. 105, Original

IN THE

Supreme Court of the United States

October Term, 1985

STATE OF KANSAS,
Plaintiff,

v.

STATE OF COLORADO,
Defendent.

COLORADO'S BRIEF IN OPPOSITION TO MOTION FOR ALTERNATIVE RELIEF.

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March 12, 1986

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INTRODUCTION

On December 16, 1986, Kansas filed a motion for leave to file a complaint against Colorado, together with a complaint alleging material depletion of the waters of the Arkansas River in Colorado in violation of the Arkansas River Compact, primarily by post-compact well development in Colorado. On February 14, 1986, Colorado filed its brief in opposition to the Kansas motion in which Colorado submitted that Kansas had not made a reasonable effort to resolve its concerns through the Arkansas River Compact Administration ("Administration") and that, absent such an effort, this Court should decline to grant the motion. Colorado pointed out that, contrary to the suggestion by Kansas, there is substantial disagreement as to whether post-compact well development in Colorado has materially depleted the flow of the Arkansas River in violation of the Compact. Colorado asserted that the Court should deny the motion for leave to file a complaint because

1. There is a pending investigation by the Administration of post-compact development in Colorado and Kansas;
2. The Administration is not deadlocked or unable to act, but had been proceeding in a cooperative manner to conduct the investigation, notwithstanding differences of opinion as to how the investigation should be conducted;
3. The investigation of well development in Colorado involves complex issues of fact;
4. Passing over the Administration would deny the Court the special expertise of the Administration in addressing the complex hydrologic facts concerning ground water use and would burden the Court with a dispute that might be resolved or narrowed by the Administration; and
5. There is little likelihood of injury while the investigation continues.

On March 3, 1986, Kansas filed a second motion which is captioned: "Motion for Leave to File Complaint or Alternatively to Compel Compliance with Administrative Investigation Pursuant to Article VIII(H) of the Arkansas River Compact." The March 3, 1986 motion makes no reference to the December 16, 1985 motion. Instead, it merely repeats, in somewhat altered form, the allegations in the complaint submitted with the December 16, 1985 motion. The only difference is that, in its second motion, Kansas prays for alternative relief as follows: (1) that the Court compel Colorado to comply with Article VIII.H. of the Compact and the Administration's March 28, 1985 resolution by ordering Colorado to investigate promptly the allegations made by Kansas; (2) that the Court enjoin all post-compact well uses in the Arkansas River Valley pending completion of the Administration's investigation by a date certain; and (3) that the Court retain jurisdiction pending the completion of the investigation by the Administration.

Since Colorado has previously filed a brief in opposition to the Kansas motion for leave to file a complaint, we will confine this brief to the motion for alternative relief.

ARGUMENT

A. Kansas Is Not Entitled To An Order Compelling An Investigation Under The Arkansas River Compact As Requested In Its March 3, 1986 Motion.

1. The Request For An Order Compelling Colorado To Investigate Is Addressed To The Wrong Party And Is Based On A Misunderstanding Of This Court's Role In Resolving Disputes Between Colorado And Kansas Under The Compact.

In its March 3, 1986 motion, Kansas first asks the Court to compel Colorado to comply with Article VIII.H. of the Compact and the Administration's March 28, 1985 resolution by ordering *Colorado* to investigate all of the allegations made by Kansas in the manner dictated by Kansas. Motion at 8. The motion overlooks the fact that the Compact created an Administration comprised of three representatives from each state. Art. VIII.C. An order compelling an investigation under Article VIII.H. would have to be directed to the individual Colorado representatives, who are not named as parties in this action and have not been served. That problem aside, however, there are other reasons why such an order should be denied.

The Arkansas River Compact was approved by Congress in 1949. Act of May 31, 1949, 63 Stat. 145. Major purposes of the Compact were to settle existing disputes, which had been the subject of litigation for nearly fifty years, and to eliminate future controversy. Art. I.

To implement the Compact's purpose of removing causes of future controversy, the Compact directs the Administration to investigate promptly alleged violations of the Compact. Art. VIII.H. The purpose of such investigations is to provide a mechanism for settling controversies by negotiation and agreement, as this Court has urged on many occasions. For example, in *Colorado v. Kansas,* 320 U.S. 383, 392 (1943), the Court stated:

> The reason for judicial caution in adjudicating the relative rights of states in such cases is that, while we have jurisdiction of such disputes, they involve the interests of quasi-sovereigns, present complicated and delicate questions, and, due to the possibility of future change of conditions, necessitate expert administration rather than judicial imposition of a hard and fast rule. . . . We say of this case, as the court has said of interstate differences of a like nature, that such mutual accomodation and agreement should, if possible, be the medium of settlement, instead of invocation of our adjudicatory power. (Footnotes omitted.)

Although Colorado and Kansas, in ratifying the Compact, did not intend to bargain away their right to bring an original action in this Court for alleged violations of the Compact,[1] it was hoped that investigations by the Administration would eliminate the need for such actions. However, this Court was never intended to function as an administrative appeals board to review decisions by the Administration. That was precisely the conclusion this Court reached in *Texas v. New Mexico,* 462 U.S. 554 (1983). In that case, the Court carefully examined the Pecos River Compact to determine the role that compact left to the Court in resolving disputes between the two compacting

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[1]This is clear from the structure of the Compact and the record of the Colorado-Kansas Arkansas River Compact Commission. The Compact provides: "Findings of fact made by the Administration shall not be conclusive in any court or before any agency or tribunal but shall constitute prima facie evidence of the facts found." Art. VIII.I. Although the Compact provides for the possibility of referring disputed matters to arbitration, there was considerable discussion during the negotiations of the Compact that both states would ultimately retain the right to bring an original action in this Court for alleged violations of the Compact if they disagreed with the Administration's findings. *E.g.,* Record of the Twelfth Meeting of the Colorado-Kansas Arkansas River Compact Commission, 12-52 to 12-53 (Feb. 3, 4, 5 and 6, 1948); Record of the Fifteenth Meeting, 15-48 to 15-50 (Sept. 13, 14, 15, and 16, 1948).

states. New Mexico argued that this Court could do nothing more than review official actions of the Pecos River Compact Commission and that the case should be dismissed if the Court found that there were no action of the commission to review or that actions taken were not arbitrary or capricious. *Id.* at 566-67.

In rejecting New Mexico's argument, this Court first noted that the mere existence of a compact does not foreclose the possibility that the Court will be required to resolve a dispute between the compacting states. 462 U.S. at 568. Further, the Court held that, in the absence of an explicit provision or other clear indication, it would not construe a compact to preclude a state from seeking judicial relief when the compact does not provide an equivalent method of vindicating a state's right. *Id.* at 569-70. The Court then emphatically rejected New Mexico's theory that the role of this Court was to review decisions of the commission:

> In recent years, we have consistently interpreted 28 U.S.C. §1251(a) as providing us with substantial discretion to make case-by-case judgments as to the practical necessity of an original forum in this Court for particular disputes within our constitutional original jurisdiction. (Citations omitted.) We exercise that discretion with an eye to promoting the most effective functioning of this Court within the overall federal system. (Citation omitted.) *If authorized representatives of the compacting states have reached an agreement within the scope of their congressionally ratified powers, recourse to this Court when one state has second thoughts is hardly "necessary for the state's protection." Massachusetts v. Missouri,* 308 U.S. 1, 18 (1939).[18] Absent extra-ordinary cause, we shall not review the Pecos River Commission's actions without a more precise mandate from Congress than either the compact or 28 U.S.C. §1251 provides. (Emphasis added.)

462 U.S. at 570-71. In footnote 18 of the opinion, the Court stated:

> When it is able to act, the Commission is a completely adequate means for vindicating either State's interests. The need for burdensome original jurisdiction litigation, which prevents this Court from attending to its appellate docket, would seem slight.

Id. at 571 n. 18.

The request by Kansas for an order compelling Colorado to investigate allegations made by Kansas under the provisions of Article VIII.H. of the Arkansas River Compact is based on a fundamental misunderstanding of the role of this Court under the Compact. In Colorado's view, the relevant issue is whether the Administration is able to act. If the Administration has agreed to proceed with an investigation, notwithstanding disagreements between the members as to how the investigation should be conducted, the Court should decline to grant the Kansas motion for leave to file a complaint or the alternative relief requested by Kansas. Merely because the Kansas Attorney General apparently had misgivings because the authorized representatives of the states agreed to continue with the investigation on the basis of a cooperative approach is not sufficient, in Colorado's judgment, to justify an original forum in this Court or any other form of relief.

According to Kansas, however, an order compelling Colorado to investigate the Kansas allegations is necessary because "Colorado refused to proceed to investigate depletions by wells and five other areas in the Resolution of October 8, 1985." Kansas Reply Brief/Brief in Support at 15. This is simply not correct. Kansas mischaracterizes the report by the director of the Colorado Water Conservation Board and the Administration's October 8, 1985 resolution. *See* Colorado's Brief in Opposition to Motion for Leave to File Complaint at 11-14. According to Kansas, "[t]hat resolution was *not* a bilateral

affirmation that the investigation should proceed, but rather a unilateral rejection of the investigation in essentially all of the areas deemed crucial by the State of Kansas." Kansas Reply Brief/Brief in Support at 15. We have read the October 8, 1985 resolution many times, but have not yet been able to read the resolution as Kansas does. In fact, the authorized representatives of the compacting states, acting within the scope of their congressionally ratified powers, reached agreement on how to proceed with an investigation of alleged violations of the Compact, notwithstanding differences of opinion as to how the investigation should be conducted. Subsequently, the Kansas Attorney General, for whatever reasons, had "second thoughts" about the cooperative approach to the investigation which the Administration adopted at its meeting on October 8, 1985, and has tried hard to characterize that resolution as something other than a directive to the committee to continue with its investigation. While Colorado believes the Court should be sensitive to charges that one state or the other is using an investigation for the purposes of delay, Colorado does not see how the facts in this case are susceptible to that interpretation.[2]

2. There Is No Basis For An Order Compelling An Investigation Because The Colorado Representatives Have Not Thwarted A Meaningful Investigation By The Administration.

As grounds for its motion to compel, Kansas maintains that the Colorado representatives have thwarted "any meaningful investigation by the Arkansas River [Compact] Administra-

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[2]As the United States Representative to the Administration pointed out in his remarks, the Administration has been successful both in the past and during the current investigation in establishing factual matters. *See* Remarks of the U.S. Representative to the Arkansas River Compact Administration at the annual meeting of the Administration held in Pueblo, Colorado (Dec. 10, 1985) (printed in Appendix A to Colorado's Brief in Opposition to Motion for Leave to File Complaint), Appendix A at 3a.

tion" of (1) post-compact well development in Colorado; (2) the operation of the Trinidad Reservoir; (3) Colorado's failure to abide by a July 24, 1951 resolution of the Administration; and (4) future plans to consume "transmountain" return flows. Each issue requires a separate response. Kansas Reply Brief/ Brief in Support at 8-9, 15.

a) Post-Compact Well Development In Colorado.

With regard to post-compact well development in Colorado, the Administration agreed in its October 8, 1985 resolution to continue with the investigation in the manner recommended by the director of the Colorado Water Conservation Board, which was to determine (1) whether there had been any unexplained declines in streamflow or changes in the relationship between streamflows at key locations in the Arkansas River Basin; and (2) if so, to investigate first the most likely causes for such declines or changes based on the timing and reach of the river in which such declines or changes had occurred.

Kansas asserts that Colorado is thereby simply "attempt[ing] to bury a problem that has plagued the state for decades." *Id.* Kansas alleges that Colorado "[f]or decades allowed the proliferation of unregulated wells in the Arkansas Valley, ignoring the inevitable effects on surface users." *Id.* at 4. And "Colorado refused to address the problem, fearing that agricultural interests would be hurt by any curtailment or regulation of wells." *Id.*

Colorado does not deny that it has struggled long and hard to achieve integrated administration of surface and ground water in the Arkansas River Valley and throughout the State of Colorado. *See, e.g., Fellhauer v. People,* 167 Colo. 320, 447 P.2d 986 (1968); *Kuiper v. Well Owners Conservation Ass'n.,* 176 Colo. 119, 490 P.2d 268 (1971) (upholding State Engineer's

rules and regulations on ground water use in the South Platte River Valley); *Kuiper v. Atchison, Topeka & Santa Fe Ry.*, 195 Colo. 557, 581 P.2d 283 (1978) (upholding water judge's decision to disapprove proposed amendment to rules and regulations on ground water use in the Arkansas River Valley and continuing in force existing rules and regulations); *Alamosa-La Jara Water Users Protection Ass'n. v. Gould*, 674 P.2d 914 (Colo. 1983) (remanding proposed rules and regulations for ground water use in the San Luis Valley for consideration by the State Engineer of additional factors, including environmental and economic concerns). What Colorado objects to in the Kansas statement of facts concerning ground water regulation in Colorado is the failure to acknowledge that Colorado was years ahead of Kansas in regulating well development.

Unregulated well development in Kansas continued until 1977 when the Kansas Chief Engineer declared a moratorium along the Arkansas River Valley in Hamilton and Kearny Counties, the two counties in southwestern Kansas closest to the Colorado-Kansas stateline.[3] By 1980, according to the U.S. Geological Survey, approximately 351,000 acres of land were irrigated by ground water or by surface water from the Arkansas River in Kansas from approximately 3,060 wells.[4] This compares to 56,000 acres that were under irrigation in Kansas in 1939. *Colorado v. Kansas*, 320 U.S. 383, 399 (1943). By contrast, the Colorado Water Judge found that wells in Colorado were used as a supplemental source of supply to irrigate existing

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[3]R. Barker, L. Dunlap, & C. Sauer, Analysis and Computer Simulation of Stream-Aquifer Hydrology, Arkansas River Valley, Southwestern Kansas, U.S.G.S. Water-Supply Paper 2200 at 1, 3 (1983).

[4]*Id.* at 8, 15 (160 wells; 31,000 acres irrigated in Phase I study area); L. Dunlap, R. Lindgren & C. Sauer, Geohydrology and Model Analysis of Stream-Aquifer System Along the Arkansas River in Kearny and Finney Counties, Southwestern Kansas, U.S.G.S. Water-Supply Paper 2253 at 11 (1985) (2,900 wells; 320,000 acres irrigated in Phase II study area).

lands.[5] In neither of its motions, nor its briefs, nor its complaint, does Kansas even acknowledge the findings by the Colorado Water Judge in December 1976 that there was no competent evidence that stream flows had in fact suffered during the post-well period in Colorado or that reductions, if any, could be traced to well diversions rather than other causes.[6]

Unwittingly, Kansas supports the Colorado Water Judge's findings. In paragraph 7 of its motion, Kansas alleges that depletions have been caused by, among other things, the proliferation of unregulated alluvial wells along the Arkansas River, "essentially all of which are located above John Martin Dam and Reservoir." Motion at 2-3, ¶ 7. However, the mass diagram analysis by the Administration's investigation committee showed that the change in relationship between flows in various reaches of the Arkansas River in Colorado had occurred *below* John Martin Reservoir, which reinforces the findings by the Colorado Water Judge and supports the conclusion of the director of the Colorado Water Conservation Board that well development in Colorado does not appear to have been a likely cause of the decline in usable stateline flows beginning in 1974. *See* Colorado's Brief in Opposition to Motion for Leave to File Complaint at 12-13. Thus, the Colorado representatives have not thwarted a meaningful investigation of post-compact well development in Colorado by the Administration. Instead, Kan-

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[5]In re the Amendment of the Rules and Regulations Governing the Use, Control and Protection of Surface and Ground Water Rights Located in the Arkansas River and Its Tributaries, Case Nos. W-4079, W-4080, W-4083, W-4084, and W-4085 at 10 (Dist. Ct., Water Division No. 2, Dec. 1, 1976), *aff'd sub. nom.* Kuiper v. Atchison, Topeka & Santa Fe Ry., 195 Colo. 557, 581 P.2d 293 (1978).

[6]*Id.* at 16.

sas only wants to recognize evidence that supports its own preconceived conclusion.[7]

b) Trinidad Reservoir.

With regard to the Trinidad Reservoir, the Colorado representatives have never refused to investigate the operation of that reservoir.

In its brief, Kansas states that the operation of Trinidad Reservoir "was initially investigated in 1981, and the ***Administration's recommendation*** that the Colorado State Engineer immediately release 18,290 acre-feet of water unlawfully stored was defeated by Colorado's negative vote on the Resolution of January 4, 1982." Kansas Reply Brief/Brief in Support at 15 (emphasis added). This is another example of the way in which Kansas has mischaracterized actions by the Administration.

First of all, the Colorado representatives agreed to an investigation of storage in Trinidad Reservoir under Article VIII.H. of the Compact at a special meeting of the Administration on June 30, 1980. Annual Report, Arkansas River Compact Administration, 47 (1980). At a special meeting on September 25, 1980, the Administration approved findings of fact concerning storage and transfer of water in Trinidad Reservoir during 1979 and 1980 based on the results of the investigation. *Id.* at 12-15. However, the Colorado representatives did not agree

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[7]The assertion by Kansas that "well depletion has been discussed, both formally and informally, at numerous meetings of the Compact Administration," Kansas Reply Brief/Brief in Support at 10, is greatly exaggerated. No doubt there was discussion of the Colorado State Engineer's efforts to regulate well development in Colorado, but it was not until Attorney General Stephan's letter of February 26, 1985, that well development in Colorado was raised for the first time by Kansas. All prior correspondence and discussion with Attorney General Stephan or with the Kansas representatives had related to the operation of Trinidad Reservoir or Pueblo Reservoir.

that those facts established a violation of the Compact. *Id.* at 48. The Administration then recommended that the Kansas Chief Engineer confer with the Colorado State Engineer "to make further inquiries into this question as expeditiously as possible." *Id.* at 48. The two engineers met in Topeka, Kansas, on July 1, 1981. Annual Report, Arkansas River Compact Administration, 55 (1981). The Colorado State Engineer then furnished to the Kansas Chief Engineer information concerning storage records requested by the Kansas Chief Engineer on the understanding that if such information was supplied, the issue concerning the operation of Trinidad Reservoir would be dropped. *Id.* at 55-56. At a special meeting of the Administration on August 6, 1981, however, the Kansas Chief Engineer indicated that the issue was not resolved. Colorado believes it is important to set the record straight on this matter. Unfortunately, the only way to do so is to quote the entire discussion from the minutes of the Administration meeting:

> Mr. Gibson [the Kansas Chief Engineer] noted that he had, during the meeting [with the Colorado State Engineer], questioned: (1) whether or not the transfer among accounts in Trinidad Reservoir had affected the river in the same manner had Trinidad Reservoir not been there, and (2) the right to make such "paper" transfers. Mr. Gibson noted that Dr. Danielson [the Colorado State Engineer] had provided information to him on the 10 year running average at the Thatcher gage, which average had been exceeded by actual flows for the entire period of available record. Mr. Gibson stated, however, that the available record covered only 10 or 11 years.
>
> Mr. Gibson went on to note that he had requested additional information at the meeting, which information was subsequently provided by Dr. Danielson. Mr. Gibson then called upon his deputy, Mr. Jerry Hilmes, to report on his review of the data provided to Mr. Gibson by Dr. Danielson in a letter dated July 29, 1981

(see Attachment B). Mr. Hilmes then reiterated the information contained in Dr. Danielson's letter of July 29.

Mr. Bentrup [a Kansas representative] asked if the Colorado State Engineer had also provided a report. Mr. McDonald [the director of the Colorado Water Conservation Board] responded that Dr. Danielson's letter of July 29 constituted his report on this matter. Mr. Bentrup indicated that the Kansas ditches were anxious to have the Administration's deliberations concluded if no further steps under Article VIII, paragraph H of the compact were to be taken. Mr. Cooley [the U.S. representative] then reviewed the chronology of the Administration's actions and the exchange of information between Colorado and Kansas. He commented that it appeared to him that Dr. Danielson's July 29 letter disposed of the questions thus far raised by Kansas. Mr. Gibson responded that he did not believe that all relevant information had yet been addressed, citing examples of what he had in mind.

Discussion ensued about the Administration's process concerning the Trinidad Reservoir matter. Mr. Bentrup reiterated his concern that the Administration not prolong the process or delay its dispositon of this matter. He noted that he had expected Dr. Danielson to report to the Administration at this meeting.

Mr. McDonald reiterated his earlier observation that the July 29 letter from Dr. Danielson constituted his report. He further stated that Colorado had responded to every request for information made to date by Kansas. He also noted that the Administration, by resolution, had asked only that the Kansas chief engineer confer with the Colorado state engineer. The Administration had not formed a committee nor asked the state engineers to prepare a report. Mr. McDonald com-

mented that he considered the initiative to be with Kansas to decide whether they were or were not satisfied with the information thus far provided to them.

At this time the Kansas delegation asked for a brief recess, which was granted by the chairman. Upon returning from the recess, the Kansas delegation indicated that they had in preparation a motion concerning the Trinidad Reservoir matter which was not then ready. They asked to go on to the next item on the agenda.

* * *

Upon reconvening, Mr. Bentrup indicated that the Kansas delegation no longer wished to offer the proposed motion on Trinidad Reservoir which was discussed prior to lunch. Rather, Mr. Bentrup indicated that Kansas would be asking the Colorado State Engineer for additional information and data concerning the operation of Trinidad Reservoir within the next couple of weeks. It was agreed that this matter would be placed on the agenda for the December, 1981, annual meeting.

Id. at 49-50, 52.

At the next meeting of the Administration on January 4, 1982, without further investigation or discussion, Mr. Bentrup, one of the Kansas representatives, proposed a resolution that the State Engineer of Colorado immediately release all water in excess of the 6,200 acre-feet stored in Trinidad Reservoir. Annual Report, Arkansas River Compact Administration 38, 57 (1982). After the motion was seconded by another Kansas representative, the minutes of the meeting state as follows:

Mr. McDonald [the director of the Colorado Water Conservation Board] noted that he respectfully disagreed with the resolution, that the Colorado State Engineer has and would continue to administer

> Trinidad Reservoir in conformance with the compact, and that Colorado had to reject the motion. The motion failed with Kansas voting yes and Colorado voting no.

Id. at 38. Thus, contrary to the statement by Kansas, there was no Administration "recommendation" that the Colorado State Engineer immediately release 18,290 acre-feet of water "unlawfully" stored in Trinidad Reservoir, but merely a resolution proposed by a Kansas representative which was voted against by the Colorado representatives. Thereafter, the Colorado Attorney General refused to join in a request by the Kansas Attorney General to arbitrate the dispute concerning Trinidad Reservoir unless and until Kansas first produced further factual information to support its contention that Trinidad Reservoir had been operated in violation of the Compact. Annual Report, Arkansas River Compact Administration, 88-89 (1983) (letter dated March 23, 1983, from Colorado Attorney General Duane Woodard to Attorney General Robert T. Stephan).

Thereafter, the Kansas Attorney General petitioned the Kansas legislature for funds and on September 23, 1983, contracted with a consulting engineering firm to analyze the operation of the Trinidad Project and other matters of concern to Kansas. Kansas Reply Brief/Brief in Support at 12. This report was completed in 1984 and a copy was transmitted to the Colorado Attorney General. However, the Kansas Attorney General's office informed Colorado that Kansas was in the process of compiling and documenting its concerns and would present a written document to Colorado officials outlining its concerns prior to the March 28, 1985 meeting of the Administration. Letter dated December 13, 1984, from John W. Campbell, Assistant Attorney General, to William H. Bassett, Assistant Attorney General. On March 28, 1985, the Kansas representatives requested the Administration to investigate the operation of the Trinidad Dam and Reservoir Project and the Colorado representatives agreed to the investigation.

The Kansas allegations concerning Trinidad Reservoir have not been the focus of the committee investigation for a simple reason. The Administration, at its annual meeting on December 11, 1984, requested the U.S. Bureau of Reclamation to initiate a review of the operating principles for the project in accordance with a condition to the operating principles which was proposed by the State of Kansas and approved by the U.S. Bureau of Reclamation and the Purgatoire River Water Conservancy District.[8] Minutes of Arkansas River Compact Administration Meeting held at Lamar, Colorado, at 10 (Dec. 11, 1984). As Kansas acknowledges in its reply brief, the U.S. Bureau of Reclamation issued a draft review of the operating principles on December 20, 1985, and requested comments on the draft review by February 15, 1986. That date was subsequently extended to March 3, 1986, at the request of the Kansas Chief Engineer. While Kansas is correct that the Bureau of Reclamation has no power to force the Colorado representatives to vote affirmatively, the essential point is that the review by the Bureau of Reclamation provides an adequate means to address its concerns about the operation of the project. *See United States v. Nevada,* 412 U.S. 534, 538 (1973); *Illinois v. Milwaukee,* 406 U.S. 91, 93-94 (1972).

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[8]The Trinidad Dam and Reservoir was authorized by Congress in the Flood Control Act of 1958. Act of July 3, 1958, 72 Stat. 305, 309, *as amended by* Act of October 27, 1965, 79 Stat. 1073, 1079. On February 10, 1967, the United States entered into a contract with the Purgatoire River Water Conservancy District ("PRWCD") which provided for construction, repayment, and operation of the project in accordance with, among other things, operating principles and the laws of the State of Colorado. Prior to signing the contract, the PRWCD adopted a resolution approving five conditions to the operating principles proposed by the State of Kansas, one of which provided for a review of the operating principles five years after beginning operation of the reservoir for irrigation "to determine the effect, if any, the operation has had on other Colorado and Kansas water users and the principles amended as necessary."

c) Pueblo Reservoir.

With regard to the Pueblo Reservoir, the Colorado representatives have never refused to investigate the operation of the reservoir. However, the only question that Kansas suggests should be investigated is whether Colorado complied with a July 24, 1951 resolution of the Administration expressing as a policy of the Administration that there be no reregulation of native waters of the Arkansas River, as proposed in a report on the Gunnison-Arkansas Project, until a plan of operation had been submitted to and approved by the Administration. As explained in Colorado's Brief in Opposition to Motion for Leave to File Complaint, the Colorado representatives have not agreed that the resolution is applicable to the Fryingpan-Arkansas Project, of which Pueblo Reservoir is a component; but, in any event, Kansas does not deny that the Administration failed to raise an objection to the winter storage program in Pueblo Reservoir for six years after it began operation in 1975, or that the winter storage program was operated since 1975 with the full knowledge of the Administration, or that the U.S. Geological Survey performed a review of the potential reduction of inflow to John Martin Reservoir from winter storage in Pueblo Reservoir in 1975 and again in 1981 and presented its findings to the Administration at a special meeting on August 6, 1981. Under the circumstances, Colorado fails to see how the Kansas complaint raises a substantial question justifying an original action in this Court or any other relief.

d) Transmountain Return Flows.

With regard to "transmountain"[9] return flows, Kansas asserts that they need to be investigated for two reasons. First, Kansas asserts that "transmountain" water imported into the Arkansas River Basin has been deducted from the upstream

[9]The term "transmountain" water in this instance refers to water imported into the Arkansas River Basin from the Colorado River Basin.

gages, while the return flows have not. Kansas Reply Brief/ Brief in Support at 16. This is correct, but this has always been the case. Water imported into the Arkansas River Basin is not apportioned to Kansas under the Arkansas River Compact. *See* Art. III.B., IV.A. To the extent "transmountain" water can be distinguished from "native" waters of the Arkansas River, it is deducted from the flow at upstream gages. Once "transmountain" water is applied to use for irrigation, it is not possible in most cases to distinguish "transmountain" return flows from "native" waters of the Arkansas River. "Transmountain" return flows, whatever the amount, that reach and are stored in John Martin Reservoir are not separately accounted for. Indeed, Colorado believes that it would be difficult, if not impossible, to do so because of the number of intervening ditches which divert water above John Martin Reservoir in Colorado. To the extent "transmountain" return flows reach, and are stored in John Martin Reservoir, Kansas receives the benefit of the additional supply, if any. Kansas has no right to "transmountain" water under the Compact and has no right to complain about proposals by the City of Colorado Springs to reuse or successively use "transmountain" water, which it has the right to do under Colorado law. Colo.Rev. Stat. §37-82-106 (1985 Cum. Supp.). Any possible injury to Kansas from the reuse of "transmountain" water is purely hypothetical at this point.

B. None Of The Factors Necessary For A Preliminary Injunction Against Post-Compact Well Uses Are Present In This Case.

In addition to its request for an order compelling Colorado to investigate, Kansas asks the Court for an order to enjoin all post-compact well uses in the Arkansas River Valley pending completion of the Administration's investigation within a time

certain. Motion at 8.[10] There is simply no basis for such extraordinary relief. An application for a preliminary injunction is addressed to the sound discretion of the Court. "Factors traditionally examined include: (1) the threat of immediate irreparable harm; (2) the likelihood of success on the merits; (3) whether the public interest would be better served by issuing than by denying the injunction; and (4) the comparable hardship inflicted upon the parties." *Massachusetts Coalition of Citizens with Disabilities v. Civil Defense Agency*, 649 F.2d 71, 74 (1st Cir. 1981); 11 C.Wright & A.Miller, Federal Practice and Procedure §2948 at 430-31 (1973).

An examination of these factors does not support the request for a preliminary injunction. First, there is no threat of immediate irreparable harm because John Martin Reservoir is nearly full at the present time and, in any event, Kansas water users have an alternate source of supply available from wells. *See* Kansas Reply Brief/Brief in Support at 19.[11] Second, the findings by the Colorado Water Court and the results of the investigation by the committee to date demonstrate there is no substantial likelihood of success on the claim that well development in Colorado has materially depleted the flows of the Arkansas River in violation of the Compact; the Kansas allegation raises complex issues of fact whose resolution is not free from doubt. This is compounded by the lack of any immediate irreparable harm. Third, the public interest would not be served by enjoining post-compact well uses in Colorado when it is apparent that well development in Kansas occurred to a far greater extent and continued long after such development was curtailed in Colo-

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[10]Presumably, Kansas only intended to ask for an order to enjoin post-compact well uses in Colorado, but its motion is not so limited.

[11]The statement that these wells "tap the nonrenewable ground water resources of the Ogallala aquifer," Kansas Reply Brief/Brief in Support at 19, is not supported by the U.S.G.S. study. *See* L. Dunlap, R. Lindgren & C. Sauer, *supra* note 4, U.S.G.S. Water-Supply Paper 2253.

rado, and particularly when Colorado water officials have made substantial efforts to regulate post-compact well development since 1965. Fourth, the hardship inflicted on Colorado well owners would be far greater than any potential benefit to Kansas in view of the fact that John Martin Reservoir is nearly full and the Kansas water users have an alternate source of supply available from wells.[12] Thus, there is no basis for a preliminary injunction.

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[12]Furthermore, some post-compact wells in Colorado are operated as alternate points of diversion for pre-compact surface water rights or are operated pursuant to court decreed plans for augmentation pursuant to which depletions are replaced from other sources. *See, e.g.,* Kelly Ranch v. Southeastern Colorado Water Conservancy Dist., 191 Colo. 65, 550 P.2d 297 (1976). And all post-compact wells are subject to the State Engineer's rules and regulations governing ground water use which have been in effect since 1972.

CONCLUSION

While it is apparent that there are matters in dispute between Kansas and Colorado,[13] these disputes involve matters which require a high degree of expert and technical knowledge and which may be resolved or narrowed by the Administration or do not otherwise justify the exercise of original jurisdiction or the extraordinary relief sought by Kansas. The following facts, however, are not in dispute:

1. On March 28, 1985, the Administration, at the request of Kansas and Colorado, adopted a resolution to investigate a number of allegations of violations of the Compact, including well development in both states.

2. The resolution established a committee consisting of the director of the Colorado Water Conservation Board or his designee and the Chief Engineer of Kansas or his designee to conduct the investigation.

3. Beginning in April, 1985, the committee devoted substantial efforts to establishing a data base and preparing a mass diagram analysis to determine if there had been any changes in the relationship between streamflows at selected locations in the Arkansas River Basin.

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[13]This is only emphasized by the accusation in the Kansas brief that Colorado "has not recited the essential facts, has dissembled those it did recite, and would mislead the Court into a decision to decline jurisdiction." Reply Brief/Brief in Support at 2. The essential point, which Kansas misses, is that the findings by the Colorado Water Court demonstrate that there is a substantial, good-faith dispute as to whether well development in Colorado has materially depleted the flows of the Arkansas River in violation of the Compact. *See* Colorado's Brief in Opposition to Motion for Leave to File Compact at 15-17.

4. On July 12, 1985, at the request of the Kansas representatives, the Administration agreed to amend the March 28, 1985 resolution to include an investigation of whether Colorado had complied with the provisions of Article V.F. of the Compact concerning the administration of decreed rights in Colorado on the basis of relative priorites.

5. On October 8, 1985, after extensive reports were submitted by both committee members on the status of the investigation and areas for further investigation, the Administration expressly authorized the committee to "continue with its investigation on the matters upon which the Committee has mutually agreed that further investigation should be undertaken."

6. John Martin Reservoir is nearly full at the present time and there is little likelihood of injury to Kansas if the Administration proceeds with its investigation.

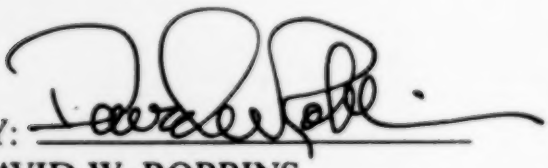
Based on the foregoing facts which are not in dispute, the Kansas motion for leave to file a complaint or, in the alternative, to compel compliance with Article VIII.H. of the Arkansas River Compact should be denied.

Respectfully submitted,

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IN THE

Supreme Court of the United States

October Term, 1985

STATE OF KANSAS,
Plaintiff,

v.

STATE OF COLORADO,
Defendant.

REPLY TO COLORADO'S BRIEF IN OPPOSITION TO MOTION FOR ALTERNATIVE RELIEF

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No. 105, Original

IN THE

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October Term, 1985

STATE OF KANSAS,
Plaintiff,

v.

STATE OF COLORADO,
Defendant.

REPLY TO COLORADO'S BRIEF IN OPPOSITION TO MOTION FOR ALTERNATIVE RELIEF

INTRODUCTION

In our reply to Colorado's Brief in Opposition to Motion for Leave to File Complaint we stated that "Colorado . . . has not related the essential facts, has dissembled those it did recite, and would mislead the Court into a decision to decline jurisdiction." *Id.*, at 2. In its Brief in Opposition to Motion for Alternative Relief, Colorado accuses Kansas of "mischaracterizing" Colorado's refusal to investigate Kansas' allegations of

compact violation pursuant to Article VIII(H). Accordingly, it should be clear to the Court that either Kansas or Colorado is not telling it straight.

The object of this reply is to let the facts tell the Court whether Colorado is complying with Article VIII(H) of the Compact or whether Colorado has purposely rendered the administrative investigation futile and useless.

ARGUMENT

POINT I

COLORADO'S REFUSAL TO CONDUCT AN ADMINISTRATIVE INVESTIGATION MAKES LITIGATION KANSAS' ONLY EFFECTIVE REMEDY; ALTERNATIVELY, THE COURT SHOULD COMPEL COLORADO TO COMPLY WITH ARTICLE VIII(H) OF THE ARKANSAS RIVER COMPACT.

A. The Resolution of October 8, 1985 Was *Not* a Bilateral Affirmation that the Investigation Should Proceed, but Rather a Unilateral Rejection of the Investigation in Regard to Each of Kansas' Allegations of Compact Violation.

Colorado puts the fundamental issue this way: "The Administration is not deadlocked or unable to act, but had been proceeding in a cooperative manner to conduct the investigation, notwithstanding differences of opinion as to how the investigation should be conducted . . .." Brief in Opposition to Motion for Alternative Relief, at 1. Without reference to the administrative record or any facts, Colorado explains that in the Resolution of October 8, 1985, "the authorized representatives of the states agreed to continue on the basis of a cooperative approach . . .." *Id.*, at 6.

The essential facts are as follows:

1. In the Compact Administration's Resolution of March 28, 1985, Colorado agreed to investigate all of Kansas' allegations of compact violation. *See,* Exhibit L, Transcript of Special Meeting of the Arkansas River Compact Administration, March 28, 1985.

2. At the meeting of the Administration's Investigation Committee on May 7, 1985, Kansas proposed a scope of work directing the investigation of specific allegations of alleged depletions. Colorado disagreed with this approach and proposed to rewrite the scope of work for consideration in June. Minutes of the Investigation Committee, Arkansas River Compact Administration, May 7, 1985.

3. On June 3, 1985, the Investigation Committee adopted a procedure to compile streamflow data and to construct a series of single and double mass diagrams of the flows of the Arkansas River and the Purgatorie River, the purpose of the mass analyses being to determine whether there had been declines in stateline flows or inflows into John Martin Reservoir. It was agreed that if the diagrams indicated that declines had in fact occurred, further studies would be undertaken to ascertain the causes. Kansas stated that transmountain return flows would have to be accounted for, and Colorado stated that it would not investigate or attempt to quantify transmountain returns. Minutes of the Investigation Committee, Arkansas River Compact Administration, June 3, 1985.

4. On July 10, 1985, Colorado again refused to quantify transmountain return flows.

5. On July 12, 1985, each state submitted its own set of mass analyses. Kansas stated its interpretation that the mass diagrams indicated postcompact depletions to usable stateline flows of 40,000 acre feet annually without adjustment for the masking of additional depletions caused by transmountain

return flows. Colorado acknowledged that stateline flows had declined from 1974-1978, but asserted that the streamflows since 1979 were nearly back to normal.

6. Separate reports, reaching different conclusions, were submitted by Kansas and Colorado in early September, 1985. *See,* "Report to the Arkansas River Compact Administration Regarding the Article VIII(H) Investigation of Alleged Violations of the Arkansas River Compact," David L. Pope, State of Kansas, September 4, 1985; "Report to Investigation Committee of the Arkansas River Compact Administration," J. William McDonald, State of Colorado, September 6, 1985. The states could not agree on a single report to the Administration and agreed to prepare supplemental reports interpreting the mass analyses and recommending further studies for the committee, if any. *See,* "Supplemental Report to the Arkansas River Compact Administration Regarding the Article VIII(H) Investigation of Alleged Violations of the Arkansas River Compact," David L. Pope, State of Kansas, October 4, 1985; "Memorandum to the Arkansas River Compact Administration," J. William McDonald, State of Colorado, October 4, 1985. *In both reports each state recognized that mass diagram analyses provide no basis on which to identify or isolate causes of indicated depletions.*

7. On October 8, 1985, it was again concluded that the states would have to submit separate reports to the Administration because they could not agree on the conclusions to be drawn from their work or on how to proceed. Colorado recommended further investigation of four possible causes of depletions. Kansas recommended further investigation of ten potential causes of the indicated depletions, including the four Colorado recommended and, most importantly, the development of alluvial wells, the operation of upstream reservoirs, and transmountain return flows. *See,* Resolution of the Arkansas River Compact Administration Regarding Continued

Violations of Alleged Compact Violations Set Forth in the Resolution of March 28, 1985, As Amended on July 12, 1985. In the Resolution, Kansas agreed to investigate everything Colorado proposed to investigate, and Colorado refused to investigate all of Kansas' allegations of compact violation. Transcript of Meeting of Arkansas River Compact Administration, October 8, 1985.

8. At the meeting of the Compact Administration on December 10, 1985, Colorado again rejected Kansas' request to investigate its allegations of depletion of the stateline flows of the Arkansas River. Additionally, Colorado refused to enjoin its postcompact ground water appropriations which result in surface depletions, despite the fact that those appropriations materially deplete the usable and available flows of the Arkansas River.

9. In its Report to the Arkansas River Compact Administration Regarding the Article VIII(H) Investigation of Alleged Violations of the Arkansas River Compact of December 6, 1985, Papadopulos & Associates expressed the opinion that postcompact well development in Colorado has materially and substantially depleted the Arkansas River and that Colorado's purposeful attempt to avoid study of well depletions is not remotely justifiable on the basis of any hydrologic or engineering reason.

10. Based on Colorado's refusal to abide by the mandate of Article VIII(H) and its initial agreement to investigate Kansas' allegations of depletion in the Resolution of March 28, 1985, and having no effective alternative but to invoke the original jurisdiction of this Court, Kansas filed this suit on December 16, 1985.

B. The Request for an Order Compelling Colorado to Comply with Article VIII(H) Need Not Be Directed to Invidual Officers of the State of Colorado.

Colorado's argument that its representatives cannot be compelled to do anything because they are not named individually is incorrect. This Court has ordered a state's agents to comply with its rulings although the state's agents were not named. *See, e.g., Nebraska v. Wyoming*, 325 U.S. 589, 665 (1945); *Arizona v. California*, 376 U.S. 340 (1963). A state acts only through its officers and agents. *Cooper v. Aaron*, 358 U.S. 1 (1958). Accordingly, any order directed to Colorado would necessarily apply to its representatives. *See, Regal Knitwear Co. v. N.L.R.B.*, 324 U.S. 9 (1945).

C. The Court Has Authority to Compel Compliance with the Provisions of the Arkansas River Compact.

Decisions of the Court confirm its ability in original actions to tailor procedure to the needs of a specific case. Although the Court uses the rules of civil procedure as a guide in original actions, it is not "invariably governed by common-law precedent or by current rules of civil procedure." *Ohio v. Kentucky*, 410 U.S. 641 (1973). Accordingly, the Court has formulated many different methods to deal with cases in its original jurisdiction. *See*, R. Stern and E. Gressman, *Supreme Court Practice*, Section 10.12 (5th ed. 1978).

The Court has authority to compel Colorado's compliance with the compact provisions. A compact is federal law. *See, Texas v. New Mexico*, 462 U.S. 554 (1983). The Court has previously compelled compliance with federal laws, including the enforcement of federal constitutional rights, statutory rights and the mandates of the Court's decisions. *See, e.g., Cooper v. Aaron*, 358 U.S. 1 (1958); *Louisiana v. United States*, 380 U.S. 145 (1965); *Vendro Co. v. Lektro-Vend Corp.*, 434 U.S. 425 (1978). Likewise, the Court has required states to abide by their obligations under a compact and refused to allow them to unilaterally define the scope of their compact obligations. *See, Virginia v. West Virginia*, 246 U.S. 565 (1918);

West Virginia ex rel. Dyer v. Sims, 341 U.S. 22 (1951); *Petty v. Tennessee – Missouri Bridge Comm.*, 359 U.S. 275 (1959) (compact obligations enforced under federal law). At the minimum, Kansas is entitled to a meaningful remedy which requires Colorado to comply with its investigatory obligations under the Compact.

1. Postcompact Well Development.

Colorado argues that the states agreed to utilize single and double mass analyses to determine whether there had been any declines in stateline flows and then "to investigate first the most likely causes for such declines . . .." Brief in Opposition to Motion for Alternative Relief, at 8. Not only was there no such agreement, it was agreed by both states that the mass analyses provided no basis whatsoever for identifying causes of indicated declines. *See, supra,* at 5. Ignoring the mandate of Article VIII(H), Colorado has arbitrarily selected four possible causes of the declines and refused to consider six other decidedly more probable causes. *Cf.*, Resolution of October 8, 1985.

Colorado also attempts to cover up its dereliction in ground water regulation by hyperbolizing about "the special expertise of the Administration in addressing the complex hydrologic facts concerning ground water use . . .." Brief in Opposition to Motion for Alternative Relief, at 1. The fact is that Colorado refuses to investigate depletions of surface flows caused by ground water diversions. It also takes no special expertise to know that water sucked through a straw empties a glass just as quickly as sipping off the surface.[1]

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[1] Colorado spends considerable time complaining about well development in Kansas, which is totally irrelevant except to the extent it has been forced on Kansas because of declines in stateline flows. *See*, Appendix A and discussion at 23-25. Unlike Colorado, Kansas is not violating state and federal law by diverting ground water. No stateline flows are being depleted by wells in Kansas.

In asserting that "the findings by the Colorado Water Judge in December 1976 that there was no competent evidence that stream flows had in fact suffered during the post-well period in Colorado or that reductions, if any, could be traced to well diversions rather than other causes" (*id.*, at 10), Colorado ignores perhaps the most important finding in regard to surface depletion, namely that "there is no dispute that well pumping depletes the river system . . .." *In re the Amendment of the Rules and Regulations Governing the Use, Control and Protection of Surface and Ground Water Rights Located in the Arkansas River and Its Tributaries,* Case Nos. W-4079, W-4080, W-4083, W-4084, and W-4085 (Dist. Ct., Water Division No. 2, Dec. 1, 1976), Finding No. 11, *aff'd sub. nom., Kuiper v. Atchison, Topeka & Santa Fe Ry.*, 195 Colo. 557, 581 P.2d 293 (1978).

Colorado fails to tell the Court that the studies relied on by the Colorado State Engineer,[2] were not discredited in the district court's findings. The thrust of the decision was the conclusion that the State Engineer's proposed amendment to the regulations was "arbitrary and capricious and invalid as a matter of law in that it was not" based on any *empirical* as opposed to what he termed "theoretical hydrological analyses." *Id.*, Conclusion No. 9 at 28; Finding No. 17 at 16.[3]

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[2] The studies were those the Colorado legislature authorized in S. 407 in 1967. *See,* Reply Brief and Brief in Support of Motion for Leave to File Complaint or Alternatively to Compel Compliance With Administrative Investigation Pursuant to Article VIII(H) of the Arkansas River Compact, at 7-8.

[3] The assertion that the Colorado district court's findings also support Colorado's conclusion "that well development in Colorado does not appear to have been a likely cause of the decline in usable stateline flows . . ." is also without foundation. While the district court did not expressly discredit the pre-1976 studies, Colorado totally hides from

Cont. p. 9

2. Trinidad Reservoir.

Colorado accuses Kansas of 'mischaracterizing' the Compact Administration's recommendation in the Resolution of January 4, 1982, that the Colorado State Engineer immediately release 18,290 acre feet of water unlawfully stored behind Trinidad Dam. Brief in Opposition to Motion for Alternative Relief, at 11. It is true that the resolution did not become "the Administration's recommendation," but only because of Colorado's negative vote.

At the meeting of the Arkansas River Compact Administration on December 14, 1982, Kansas proposed a similar resolution with respect to the subsequent unlawful storage of 20,000 acre feet in violation of "Article IV(D) of the Arkansas River Compact . . .." Minutes of the Arkansas River Compact Administration, Appendix C-1, December 14, 1982, at 44. Instead of voting negatively, Colorado offered a substitute motion denying that the storage was unlawful and urging that the Administration "shall not consider further the allegations of the State of Kansas that the 1979 and 1980 administration of Trinidad Reservoir violate[s] article IV(D) of the Arkansas River Compact . . .." *Id.*, at 44. Due to Colorado's position, no agreement was reached between the states.

Footnote 3, cont. from p. 8.

all of the post-1976 studies. Most of the studies relied on by Kansas in regard to the fact that the alluvial wells in Colorado have severely depleted the surface flows of the Arkansas River are post-1976 studies, *See, e.g.*, Simons, Li & Associates, Inc., "Preliminary Assessment – Development and Administration of Water Resources of the Arkansas River"; S. S. Papadopulos & Associates, Inc., "Report to the Arkansas River Compact Administration Regarding the Article VIII(H) Investigation of Alleged Violations of the Arkansas River Compact (December 6, 1985)"; S. S. Papadopulos & Associates, Inc., "Status Report on Evaluation of Streamflow Depletions Along the Arkansas River (February 17, 1986)".

Finally, Colorado's statement that "[t]he Kansas allegations concerning Trinidad Reservoir have not been the focus of the committee investigation . . . [because the Administration] requested the U.S. Bureau of Reclamation to initiate a review of the operating principles for the project . . ." is nonsense. Brief in Opposition to Motion for Alternative Relief, at 15. Colorado also argues "that the review by the Bureau . . . provides an adequate means to address its concerns about the operation of the project." This statement is also absurd. In its Review the Bureau agrees with Kansas that Trinidad Reservoir has been operated in violation of the Operating Principles. In a letter to the Bureau dated March 3, 1986, Colorado takes the same position that it took in its substitute motion on December 14, 1982.

Nothing has changed. Kansas and Colorado have different views of the legality of the operation of Trinidad Reservoir. The Bureau of Reclamation can't do anything about it, and Colorado refuses to submit the issue to arbitration or to allow it to be investigated pursuant to Article VIII(H).

3. Pueblo Reservoir.

Colorado states that "the only question that Kansas suggests should be investigated is whether Colorado complied with a July 24, 1951 resolution of the Administration . . . that there be no reregulation of native waters of the Arkansas River . . . until a plan of operation [has] been . . . approved by the Administration." Brief in Opposition to Motion for Alternative Relief, at 16. Colorado forgets that it initially agreed in the Resolution of March 28, 1985 that the "Arkansas River Compact Administration shall, in accordance with Article VIII(H) of the Arkansas River Compact, promptly investigate . . . the operation of Pueblo Dam and Reservoir . . . and the winter water storage program on the Arkansas River in Colorado . . .." On October 8, 1985, as discussed above, Colorado

repudiated its agreement to investigate the operation of Pueblo Reservoir.

It is Kansas' position that the winter water storage program and the operation of Pueblo Reservoir have adversely affected the regimen of the Arkansas River. Under Article V of the Compact, Kansas is entitled to 40 percent of the water entering the downstream conservation pool of John Martin Reservoir. Prior to 1976, when the storage program went into effect, winter inflows into John Martin averaged 17,400 acre feet annually; since then, the average inflows dropped to 10,900 acre feet.[4] *See, generally*, "Evaluation of the Arkansas River Winter Water Storage Program in Colorado," Spronk Water Engineers, Inc., at 66-68 (June 1985).

While Kansas is more interested in the water Colorado is converting through the operation of its winter water storage program, it is also interested in Colorado's continuing refusal to abide by the Compact Administration's Resolution of July 24, 1951. That Resolution approved the Fryingpan-Arkansas Project with the stipulation that Administration approval of a plan of operation would have to be obtained prior to any reregulation of native water, i.e., winter storage. *See, e.g.*, House Document No. 187, 83rd Congress, 1st Session (June 18, 1953); House Document No. 353, 86th Congress, 2nd Session (March 7, 1960); House Document No. 130, 87th Congress, 1st Session (March 15, 1961); House Report No. 694, 87th Congress, 1st Session (July 11, 1961); Senate Report No. 1742, 87th Congress, 2nd Session (July 19, 1962).

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[4] The difference of 6,500 acre feet annually may seem small to those unfamiliar with western water disputes. While the figure is a small percentage of the total amount of Colorado's postcompact depletions of stateline flows, it is more water than was involved in one of the Court's last interstate disputes, *viz.*, *Colorado v. New Mexico*, 459 U.S. 176 (1982), *dismissed*, 104 S.Ct. 2433 (1984).

In order to avoid the scrutiny of the Compact Administration pursuant to the Resolution of July 24, 1951, Colorado frivolously argues that the resolution related to the Gunnison-Arkansas Project and not the Fryingpan-Arkansas Project. The simple fact of the matter is that the Roaring Fork Diversion Unit of the Gunnison-Arkansas Project was renamed the Fryingpan-Arkansas Project for political reasons. Until Colorado's recent refusal to investigate the operation of Pueblo Reservoir and the winter water storage program, there was no doubt that the substance of the resolution was unaffected by the name change that was needed to secure the authorization of the project.

Colorado also attempts to avoid its obligation under the resolution by stating that "in any event, Kansas does not deny that the Administration failed to raise an objection to the winter storage program . . . for six years after its operation began . . .." Brief in Opposition to Motion for Alternative Relief, at 16. Laches, however, does not operate against a state in interstate water matters. *See,* Report of Special Master on His Decision and Supplemental Decision Regarding the Affirmative Defenses of New Mexico to the Complaint of Texas, July 6, 1977, at 12-13, *adopted, Texas v. New Mexico,* 434 U.S. 809 (1977).

4. Transmountain Return Flows.

Colorado admits that it has refused to investigate transmountain return flows, but urges inappositely that "[w]ater imported into the Arkansas River Basin is not apportioned to Kansas under" Articles III(B) or IV(A) of the Arkansas River Compact. Kansas has not alleged an entitlement to transmountain waters under the Compact. It is uncontroverted, however, that these transmountain returns add water to the Arkansas River that "mask . . . depletions [of native water] which will continue if these . . . flows are removed from the river." Minutes

of the Arkansas River Compact Administration Meeting, October 8, 1985, at 26. Consequently, the issue of returns is hardly "hypothetical" and the Administration *must* know the amount of the returns to quantify the depletions of native water under Article VIII(H).

In addition to Colorado's refusal to cooperate in order that its courts might approve programs of return flow utilization,[5] Colorado also tries to justify its refusal to quantify return flows by arguing that "it would be difficult, if not impossible, to do so . . .." Brief in Opposition to Motion for Alternative Relief, at 17. This alleged difficulty is belied by Colorado law. In order to obtain a court decree approving a program of return flow utilization, the applicant must be able to isolate the returns from native returns. In Colorado Springs' application, for example, it is asserted in paragraph 6(a)(iv) that:

> Colorado Springs will utilize appropriate measurement and/or accounting methods to determine accurately on a daily basis the portion of return flows of the Fountain Creek that is attributable to return flows from the Transmountain Sources . . ..

See, "City of Colorado Springs, Arkansas River Review Exchange Plan," Gronning Engineering Co., Denver, Colorado, March, 1986. *See, generally*, "Application for an Absolute Right for Existing Exchange and Reuse Program and for a Conditional Decree for a Proposed Exchange and Reuse Program in the Arkansas River and Its Tributaries," Water Division No. 2, Case No. 84-CW-203; *see, also*, Application of the Board of Water Works of Pueblo, Colorado, Case No. 84-CW-177.

---

[5] Colorado's tactic is legally unsound because its courts have no authority to define its obligations under a compact. *See, West Virginia ex rel Dyer v. Sims*, 341 U.S. 22 (1951). Nevertheless, as a practical matter, Colorado is seeking to tie up the only wet water that's still in the river.

Transmountain return flows in the Arkansas River are neither hypothetical nor metaphysical. They are an essential matter that Colorado refuses to investigate.[6] There is no possibility that Colorado will even discuss the matter – its representative to the Administration's Investigation Committee has "ruled out" any assessment of transmountain returns. *See,* Minutes of the Arkansas River Compact Administration Meeting, October 8, 1985, at 32.

POINT II

THIS COURT SHOULD EXERCISE ITS DISCRETIONARY AUTHORITY BY ENJOINING COLORADO'S POSTCOMPACT WELL USES UNTIL COMPLETION OF A MEANINGFUL ADMINISTRATIVE INVESTIGATION.

Colorado has noted the traditional requisites of injunctive relief and that the issuance of the equitable order rests in the sound discretion of the Court. While Kansas has no quarrel with these elements in theory, Colorado's application of the elements to the facts misses the mark.

Colorado asserts that there is no threat of irreparable harm to Kansas, while ignoring its unilateral refusal to investigate the documented finding that the proliferation of wells has

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[6] There are nine structures that divert water into the Arkansas River Basin from the Colorado River Basin. The mean annual transmountain diversion before the Arkansas River Compact was adopted was 16,430 acre feet. In the postcompact period 1949-1973, the mean annual diversion was 68,950 acre feet. In the critical period 1974-1984, when Colorado depleted the stateline flows by approximately 50,000 acre feet annually (without accounting for the masking), the mean was 137,450 acre feet. In other words, the amount of masking of native depletions in violation of the Compact is not small.

caused 150,000 acre-feet per year of depletion to the Arkansas River. *Preliminary Assessment – Development and Administration of Water Resources of the Arkansas River, Art. IV.* This continuing damage is not imaginary; it is immediate, continuing, and cannot begin to be rectified until Colorado complies with the mandate of Article VIII(H) of the Compact. *United States v. W. T. Grant Co.*, 345 U.S. 629 (1953) (recurrent injury provides basis for injunctive relief); *Chance v. Board of Examiners,* 561 F.2d 1079 (2d Cir. 1977) (continuing violations constitute irreparable harm). In the meantime, however, Colorado proposes that Kansas idly ignore the substantial depletions in stateline flows until Colorado benevolently decides to honor its compact obligations.

The resulting injury to Kansas is apparent. Due to Colorado's unregulated pumping from the aquifer hydraulically connected to the live river above John Martin Reservoir, "the average stateline flow during the period of 1974 through 1979 was 55 cfs, a major reduction." As illustrated in Appendix A, Colorado's acquiescence in unregulated well pumping has resulted in a marked reduction of ditch deliveries to Kansas for irrigation.

This damage cannot be hidden by Colorado's assertion that "Kansas water users have an alternative source of supply available from wells." Colorado's Brief in Opposition to Motion for Alternative Relief, at 19. The fact is that Kansas has been forced to make up the deficiency in surface deliveries by tapping the nonrenewable ground water of the Ogallala aquifer. During 1979 through 1980, Kansas' necessary appropriations of ground water have caused the Ogallala aquifer to decline from 20 to 80 feet. L. Dunlap, R. Lindgen & C. Surer, *U.S. Geological Survey – Water Supply Paper 2253,* at 48 (1985).

Given the substantial depletion of the Ogallala aquifer caused by Colorado's continuing reduction of stateline surface flows, the suggestion that Kansas has no irreparable harm and "has

no substantial likelihood of success on [its] claim" is implausible. Colorado's Brief in Opposition to Motion for Alternative Relief, at 19. Certainly Kansas will not succeed on the merits if Colorado continues to stonewall the administrative process. With a meaningful determination of surface flow declines, however, Kansas' entitlement to its apportioned share of the Arkansas River flow cannot be seriously disputed. Pending that determination, Colorado should be enjoined from all post-compact well uses in the Arkansas River Valley.

CONCLUSION

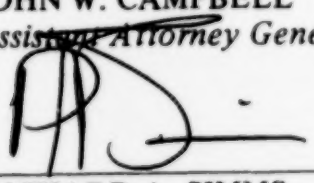
In Justice Brennan's opinion for the Court in *Texas v. New Mexico*, 462 U.S. 554 (1982), it was noted that access to the Court's original jurisdiction raises a question of "the *practical necessity* of an original forum in this Court for particular disputes within our constitutional original jurisdiction." *Id.*, at 570 (emphasis added). Despite the mandatory command of Article VIII(H) of the Compact, Colorado has repeatedly refused to investigate Kansas' allegations of violation. If Kansas is denied the remedy contemplated in Article III, Section 2, Clause 2 of the Constitution of the United States, Colorado

could "for all practical purposes, avoid [this forum] at will." *Texas v. New Mexico*, 462 U.S. 554, 569 (1982).

Respectfully submitted,

ROBERT T. STEPHAN
Attorney General of Kansas

JOHN W. CAMPBELL
Assistant Attorney General



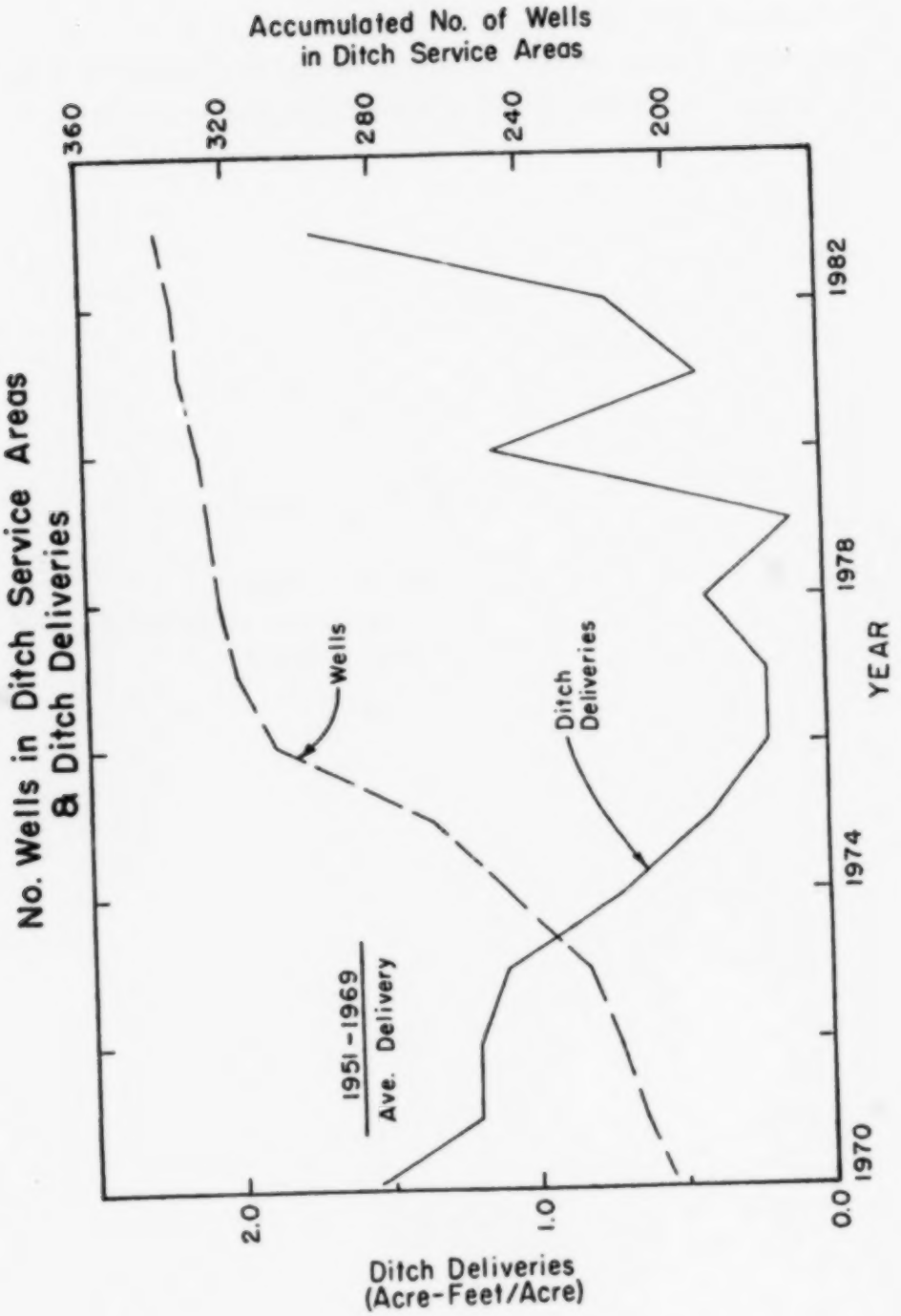
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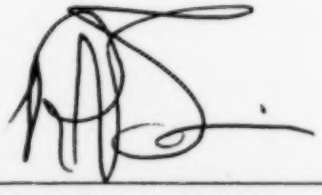
APPENDIX A


Accumulated No. of Wells
in Ditch Service Areas
360
320
280
240
200
No. Wells in Ditch Service Areas
& Ditch Deliveries
Wells
Ditch
Deliveries
1951-1969
Ave. Delivery
1982
1978
1974
1970
YEAR
2.0
1.0
0.0
Ditch Deliveries
(Acre-Feet/Acre)

CERTIFICATE OF SERVICE

Pursuant to Rule 28(5) of the Supreme Court Rules, I certify that three copies of the foregoing Reply to Colorado's Brief in Opposition to Motion for Alternative Relief were served on March 18, 1986 on:

David W. Robbins
Hill & Robbins
1441 Eighteenth Street, Suite 100
Denver, Colorado 80202



RICHARD A. SIMMS
Special Assistant Attorney General
Counsel of Record

Supreme Court, U.S.
FILED
MAY 22 1986
JOSEPH F. SPANIOL, JR.
CLERK

No. 105, Original

IN THE

Supreme Court of the United States

October Term, 1985

STATE OF KANSAS,
Plaintiff,

v.

STATE OF COLORADO,
Defendant.

COLORADO'S ANSWER, COUNTERCLAIM, AND MOTION FOR APPOINTMENT OF SPECIAL MASTER

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~~March~~ May 22, 1986

13 pp



No. 105, Original

IN THE

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October Term, 1985

STATE OF KANSAS,
Plaintiff,

v.

STATE OF COLORADO,
Defendant.

COLORADO'S ANSWER, COUNTERCLAIM, AND MOTION FOR APPOINTMENT OF SPECIAL MASTER

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ANSWER

Defendant, the State of Colorado, for its answer to the complaint filed in the above-captioned action by Plaintiff, the State of Kansas, states:

1. Defendant admits the Court has jurisdiction under the allegations in paragraph 1 of the complaint. Defendant denies that this is an appropriate case for the Court to exercise such jurisdiction because Plaintiff has failed to exhaust its administrative remedies under Article VIII. of the Arkansas River Compact.

2. Defendant admits the allegations in paragraph 2 of the complaint.

3. Defendant admits the allegations in paragraph 3 of the complaint.

4. Defendant admits that one of two major purposes of the Arkansas River Compact is quoted in paragraph 4 of the complaint. Defendant denies the allegations of paragraph 4 insofar as they assert that the purpose set forth in Article I.B. of the Compact is the "principal" purpose of the Arkansas River Compact.

5. Defendant admits that a portion of Article IV.D. of the Arkansas River Compact is quoted in paragraph 5 of the complaint. Defendant denies the allegations of paragraph 5 insofar as they assert Plaintiff's interpretation of Article IV.D.

6. Defendant admits that a portion of the first sentence of Article V.F. of the Arkansas River Compact is quoted in paragraph 6 of the complaint. The first sentence of Article V.F. in its entirety reads as follows:

> In the event the Administration finds that within a period of fourteen (14) days the water in the conservation pool will be or is liable to be exhausted, the Administration shall forthwith notify the State Engineer of Colorado, or his duly authorized representative, that

commencing upon a day certain within said fourteen (14) day period, unless a change of conditions justifies cancellation or modification of such notice, Colorado shall administer the decreed rights of water users in Colorado Water District 67 as against each other and as against all rights now or hereafter decreed to water users diverting upstream from John Martin Dam on the basis of relative priorities in the same manner in which their respective priority rights were administered by Colorado before John Martin Reservoir began to operate and as though John Martin Dam had not been constructed.

Defendant affirmatively alleges that the Arkansas River Compact Administration by resolution in 1980 adopted an operating plan for John Martin Reservoir which modifies the method by which the Administration finds that the water in the conservation pool is exhausted for the purposes of Article V.F.

7. Defendant denies the allegations in paragraph 7 of the complaint.

8. Defendant denies the allegations in paragraph 8 of the complaint.

9. Defendant denies the allegations in paragraph 9 of the complaint.

10. Defendant admits that for more than twenty years its agencies or officials have investigated ground water appropriations in the Arkansas River Basin in Colorado. Defendant denies the remaining allegations of paragraph 10 of the complaint.

11. Defendant denies the allegations in paragraph 11 of the complaint.

12. Defendant admits that the Arkansas River Compact Administration was in the process of conducting an investigation of alleged Compact violations pursuant to Article VIII.H. of the Arkansas River Compact at the time Plaintiff commenced this proceeding on December 16, 1985, and that

Defendant refused to enjoin all post-compact ground water appropriations in Colorado during the pendency of the investigation. Defendant admits that the Colorado representatives to the Arkansas River Compact Administration rejected requests by the Kansas representatives to investigate the consequences of possible future increases in the consumption of Colorado's "transmountain" return flows. Defendant denies the remaining allegations of paragraph 12 of the complaint.

13. Defendant denies the allegations in paragraph 13 of the complaint.

14. Defendant denies the allegations in paragraph 14 of the complaint.

15. Defendant denies the allegations in paragraph 15 of the complaint.

AFFIRMATIVE DEFENSES

1. Plaintiff failed to exhaust its administrative remedies under Article VIII. of the Arkansas River Compact.

2. Plaintiff's claims against Defendant are barred by laches, estoppel, waiver, or the equitable doctrine of unclean hands.

3. With regard to Plaintiff's claim that Defendant and its water users have materially depleted the usable and available stateline flows of the Arkansas River since the adoption of the Compact to the injury of water users in Kansas under the Compact, Defendant asserts that irrigation in the Arkansas River basin in Colorado has declined since the adoption of the Compact and that acreage under irrigation in western Kansas has increased at least five-fold in the same period, from approximately 56,000 acres in 1948 to 350,000 acres in 1980. Plaintiff seeks to have this Court rewrite the Arkansas River Compact to impose a new stateline delivery obligation on Colorado so as to maintain a post-compact well economy in western Kansas, all at the expense of Colorado water users, contrary to the express terms of the Compact.

4. Waters brought into the Arkansas River basin from other river basins are not apportioned to Kansas under the Arkansas River Compact and Plaintiff has no claim or right to such waters.

5. In 1980, the Arkansas River Compact Administration approved an operating plan for John Martin Reservoir pursuant to which water stored in the conservation pool of the reservoir is transferred into separate storage accounts for Kansas and ditches in Colorado Water District 67 at agreed upon rates and is apportioned into the accounts in agreed upon percentages. Based upon a series of agreements among Colorado water users, after water stored in the conservation pool is fully transferred to the separate storage accounts, but not necessarily released from the reservoir, Colorado reverts to administration of decreed priorities and the decreed rights of water users in Colorado Water District 67 are administered as against rights decreed to water users diverting upstream from John Martin Dam on the basis of relative priorities in the same manner as though John Martin Dam had not been constructed. The Colorado representatives approved the operating plan in 1980 and have allowed the operating plan to remain in effect from year-to-year thereafter, to the substantial benefit of Kansas water users, based upon the aforesaid agreements among Colorado water users to determine when a "call" by ditches in Colorado Water District 67 will be enforced above John Martin Reservoir. Those agreements were in turn based on an agreement to permit storage of historical direct-flow winter diversions upstream from John Martin Reservoir. Plaintiff has accepted the benefits of the 1980 operating plan and agreed to its terms with knowledge of the agreements among Colorado water users and with knowledge that the 1980 operating plan would change the regimen of the Arkansas River. Therefore, by having accepted the benefits of the 1980 operating plan, Plaintiff is barred from asserting that any reregulation of the native waters of the Arkansas River be approved by the Compact Administration based upon the Administration's Resolution of July 24, 1951.

6. With regard to Plaintiff's allegation that Defendant, through its Compact "Commissioner", has rejected and continues to reject Plaintiff's requests to investigate Defendant's "unilateral rejection" of the Arkansas River Compact Administration's Resolution of July 24, 1951, Defendant denies that the Resolution has any binding effect on Defendant. In the alternative, the Resolution was amended by the Administration on January 4, 1982. Further, Plaintiff failed to raise an objection to the winter storage program in Pueblo Reservoir for six years after it began operation in 1975 with the full knowledge of Plaintiff and the Administration.

COUNTERCLAIM

Defendant, the State of Colorado, by its Attorney General, asserts the following counterclaim against Plaintiff, the State of Kansas.

1. The Court has jurisdiction of this counterclaim under Article III, Section 2, Clause 2 of the Constitution of the United States, and Paragraph (a), Subsection (1), Section 1251, Title 28 of the United States Code.

2. The Arkansas River is an interstate stream which rises in the Rocky Mountains near Leadville, Colorado, then flows southeasterly to Salida, Colorado, then east through Canon City to Pueblo, Colorado, then across the plains of eastern Colorado into the State of Kansas.

3. In order to settle existing disputes and to remove causes of future controversy concerning the waters of the Arkansas River and to equitably divide and apportion between the States of Colorado and Kansas the waters of the Arkansas River, as well as the benefits arising from the construction, operation, and maintenance of John Martin Reservoir for water conservation purposes, the States of Colorado and Kansas ratified the Arkansas River Compact, which Compact was approved by the United States Congress by Act of May 31, 1949, 63 Stat. 145.

4. Article V.E.(2) of the Arkansas River Compact provides: "Water released upon concurrent or separate demands shall be applied promptly to beneficial use unless storage thereof downstream [from John Martin Reservoir] is authorized by the [Arkansas River Compact] Administration."

5. On information and belief, the state officials charged with administration of water rights in Kansas have allowed water released from John Martin Reservoir upon demand by Kansas under Article V. of the Arkansas River Compact to be stored downstream in Lake McKinney in Kansas rather than being applied promptly to beneficial use, in violation of the provisions of Article V.E.(2) of the Compact.

6. Subsequent to the approval of the Arkansas River Compact by the United States Congress in 1949, state officials charged with the administration of water rights in Kansas have allowed the construction of wells and have permitted ground water appropriations in Kansas that have materially depleted the usable quantity or availability for use to the surface water users in Kansas under the Compact. Those depletions caused Kansas to make additional demands for releases of water stored in John Martin Reservoir pursuant to the Compact to the detriment of water users in Colorado.

7. Irreparable injury to the State of Colorado and water users in Colorado under the Compact has been caused by the acts and conduct of the State of Kansas, its officers, and citizens in permitting the use of the waters of the Arkansas River in violation of the terms of the Compact.

WHEREFORE, having fully answered and having asserted its affirmative defenses and counterclaim, Defendant prays that the Court grant judgment for Defendant and against Plaintiff on the claims of Plaintiff, that the Court issue its decree compelling the State of Kansas, its officers, and citizens to comply with the provisions of the Arkansas River Compact, that

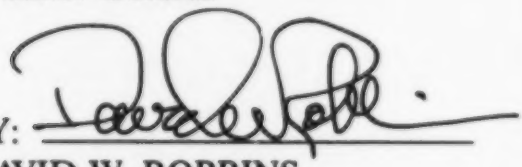
Defendant have and recover its reasonable costs, and for such other and further relief as the Court may deem just and proper under the circumstances.

Respectfully submitted,

DUANE WOODARD
Attorney General of Colorado

CHARLES B. HOWE
Chief Deputy Attorney General

RICHARD H. FORMAN
Solicitor General

BY: 
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MOTION FOR APPOINTMENT OF SPECIAL MASTER

Defendant, the State of Colorado, by its Attorney General, respectfully moves the Court to appoint some suitable person as Special Master in this action and to refer this matter to him or her with authority to take evidence and to report the same to the Court with his or her findings of fact, conclusions of law, and recommendations for decree, all to be subject to approval or other disposition by this Court.

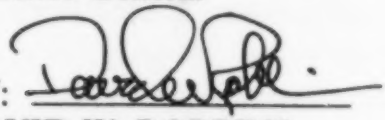
In support of this motion Defendant calls the attention of this Court to the pleadings, an inspection of which discloses many issues of fact which cannot be tried conveniently except by the appointment of a Special Master.

Respectfully submitted,

DUANE WOODARD
Attorney General of Colorado

CHARLES B. HOWE
Chief Deputy Attorney General

RICHARD H. FORMAN
Solicitor General

BY: 
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FILED
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JOSEPH F. SPANIOL, JR.
CLERK

No. 105, Original

IN THE

Supreme Court of the United States

October Term, 1985

STATE OF KANSAS,
Plaintiff,

v.

STATE OF COLORADO,
Defendant.

KANSAS' REPLY TO COLORADO'S COUNTERCLAIM

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June 10, 1986

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No. 105, Original

IN THE

Supreme Court of the United States

October Term, 1985

STATE OF KANSAS,
Plaintiff,

v.

STATE OF COLORADO,
Defendant.

KANSAS' REPLY TO COLORADO'S COUNTERCLAIM

Pursuant to Rule 9 of the Rules of the Supreme Court and Rule 7 of the Rules of Civil Procedure, the plaintiff, State of Kansas, replies to the State of Colorado's counterclaim by stating:

1. The plaintiff admits the allegation of jurisdiction in paragraph one.

2. The plaintiff admits the allegations in paragraphs two, three, and four.

3. The plaintiff denies the allegation of malfeasance on the part of officials charged with the administration of water rights in Kansas in paragraph five and further denies that Kansas water users have not promptly applied water to beneficial use as provided in Article V(E)(2) of the Arkansas River Compact.

4. The plaintiff denies the allegations in paragraph six.

5. The plaintiff denies the allegations in paragraph seven.

AFFIRMATIVE DEFENSES

1. As defined in Article III(B) of the Arkansas River Compact, the waters of the Arkansas River controlled by the Compact are those waters "originating in the natural drainage of the Arkansas River, including its tributaries, upstream from the Stateline . . . ." Accordingly, any depletion of surface flow of the Arkansas River in Kansas which might occur as a result of ground water diversions in Kansas, could not affect Colorado's obligation to make deliveries of usable stateline flows pursuant to the Arkansas River Compact.

2. Diversions of ground water in Kansas violate no interstate compact or federal law.

3. Any use of ground water in Kansas is irrelevant to the substantial, postcompact decline in usable stateline flows caused by the State of Colorado and its water users, except to the extent that Colorado's failure to deliver stateline flows has forced Kansas users, to their injury, to rely alternatively on ground water sources of supply below the stateline.

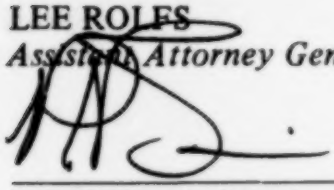
WHEREFORE, the State of Kansas respectfully prays that the Court issue its decree commanding the State of Colorado, its officers, citizens, and political subdivisions to deliver the waters of the Arkansas River in accordance with the provisions of the Arkansas River Compact and providing for such other and further relief as the Court may deem appropriate.

Respectfully submitted,

ROBERT T. STEPHAN
Attorney General of Kansas

JOHN W. CAMPBELL
Assistant Attorney General

LEE ROLES
Assistant Attorney General



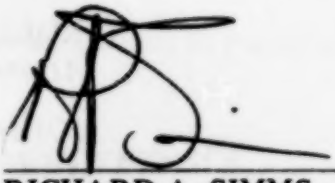
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CERTIFICATE OF SERVICE

Pursuant to Rule 28(5) of the Supreme Court Rules, I certify that twelve copies of the foregoing Kansas' Reply to Colorado's Counterclaim were served on June 10, 1986 on:

David W. Robbins
Hill & Robbins
1441 Eighteenth Street, Suite 100
Denver, Colorado 80202



RICHARD A. SIMMS
Special Assistant Attorney General
Counsel of Record

Supreme Court, U.S.
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No. 105 Original

IN THE
Supreme Court of the United States
October Term, 1985

STATE OF KANSAS
Plaintiff,

v.

STATE OF COLORADO
Defendant.

MOTION TO REFER MOTION FOR LEAVE TO AMEND COMPLAINT

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STATE OF KANSAS
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STATE OF COLORADO
Defendant.

MOTION TO REFER MOTION FOR LEAVE TO AMEND COMPLAINT

The State of Kansas hereby moves the Court to refer the attached Motion for Leave to Amend Complaint to the Special Master, the Honorable Arthur L. Littleworth, for his findings, conclusions, and recommendations.

In support hereof, Kansas states:

1. Kansas filed its motion for leave to file complaint on December 16, 1985.

2. On February 14, 1986, Colorado filed its brief in opposition for leave to file, based solely on the alleged failure to have exhausted administrative remedies.

3. On March 4, 1986, Kansas replied by filing an alternative motion to compel Colorado's compliance with an administrative investigation by the Arkansas River Compact Administration pursuant to Article VIII-H of the Compact. Act of May 31, 1949, 63 Stat. 145.

4. Following further argument over the issue of exhaustion, the Court granted leave to file the complaint on March 24, 1986.

5. In its answer, Colorado raised the alleged failure to exhaust administrative remedies as an affirmative defense.

6. Since leave to file was granted, the parties have been preparing for trial. The case is set for trial commencing on January 15, 1990.

7. Following a status conference on February 26, 1988, by order of March 14, 1988, the Special Master set May 13, 1988, as the deadline within which Colorado could move for partial summary adjudication on the basis of the alleged failure to exhaust administrative remedies.

8. Colorado again raised the alleged failure to exhaust administrative remedies in its motion to stay proceedings on May 12, 1988.

9. By his Decision of Special Master on Colorado Motion to Stay, the Special Master denied the motion on October 21, 1988.

10. On November 26, 1988, by direction of the Special Master, Colorado filed a second motion to stay, alleging failure to exhaust administrative remedies with respect to one allegation of compact violation not embraced by the first motion to stay. Simultaneously, Colorado filed a motion for partial summary judgment on an alleged factually undisputed legal question.

11. Kansas has responded to the motion to stay and the motion for partial summary judgment before the Special Master simultaneously with this filing with the Court. Kansas' Response to Colorado's Second Motion to Stay is attached hereto and incorporated herein as Appendix A.

12. While wholly lacking on its merits, Colorado's second motion to stay raised past and continuing violations by Colorado of Article V-E-3, V-E-4, and V-H-2 of the Arkansas River Compact.

13. The factual allegations of material depletion of stateline flows which underlie the violations of Article V-E-3, V-E-4, and V-H-2, were alleged in the original complaint.

14. The violations of Article V-E-3, V-E-4, and V-H-2 raise no new issues of fact, but present questions of law and equity.

15. The grant of Kansas' motion to amend would not raise additional questions of alleged failure to exhaust administrative remedies.

16. The grant of Kansas' motion to amend complaint to express an allegation of violation of Article V-E-3, V-E-4, and V-H-2 would not increase trial preparation time or delay the trial setting.

17. The State of Colorado would not be prejudiced by the granting of Kansas' motion to amend complaint.

18. An understanding of Kansas' motion to amend complaint rests on Kansas' Response to Colorado's Second Motion to Stay, attached hereto as Appendix A, which is presently pending before the Special Master.

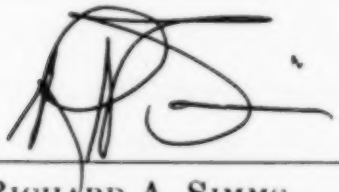
WHEREFORE, the State of Kansas moves that the Court refer the attached Motion for Leave to Amend Complaint to the Special Master for his findings, conclusions, and recommendations.

Respectfully submitted,

ROBERT T. STEPHAN
Attorney General of Kansas

JOHN W. CAMPBELL
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October Term, 1985

STATE OF KANSAS
Plaintiff,

v.

STATE OF COLORADO
Defendant.

MOTION FOR LEAVE TO AMEND COMPLAINT

The State of Kansas hereby moves to amend its complaint by adding thereto the following allegation:

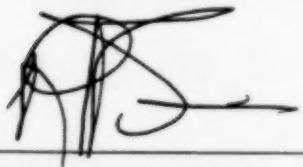
> The State of Colorado has failed and continues to fail to make deliveries of releases to which Kansas is entitled from John Martin Reservoir by an equivalent in stateline flow, as required by Article V-E-3 of the Compact, and in violation of Articles V-E-4 and V-H-2.

Respectfully submitted,

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Attorney General of Kansas

JOHN W. CAMPBELL
Deputy Attorney General

LELAND E. ROLFS
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CERTIFICATE OF SERVICE

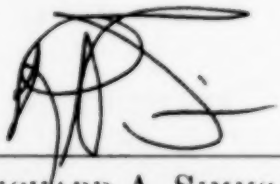
I, Richard A. Simms, hereby certify that I caused to be mailed three copies of Kansas' Motion to Refer Motion to Amend Complaint and Motion to Amend Complaint to be served by first-class mail on the following this 27th day of January, 1989:

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APPENDIX A
No. 105 Original

IN THE
Supreme Court of the United States
October Term, 1985

BEFORE THE HONORABLE ARTHUR L. LITTLEWORTH,
SPECIAL MASTER

STATE OF KANSAS
Plaintiff,

v.

STATE OF COLORADO
Defendant.

KANSAS' RESPONSE TO COLORADO'S SECOND MOTION TO STAY

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BEFORE THE HONORABLE ARTHUR L. LITTLEWORTH,
SPECIAL MASTER

STATE OF KANSAS
Plaintiff,

v.

STATE OF COLORADO
Defendant.

AFFIDAVIT OF DAVID L. POPE

STATE OF KANSAS
COUNTY OF SHAWNEE } ss:

I, DAVID L. POPE, being first duly sworn, upon oath state:

1. That I am presently employed by the Division of Water Resources, Kansas State Board of Agriculture as the Chief Engineer-Director and have been so employed since March 1, 1983. I am the chief state official charged with the administration of water rights in the State of Kansas.

2. That since March 1983 I have been, and am, one of the three Kansas representatives on the Arkansas River Compact.

3. That on March 28, 1985, the Arkansas River Compact Administration adopted a Resolution in Garden City, Kansas, initiat-

ing an investigation under Article VIII-H of the Arkansas River Compact.

4. That Resolution designated me, by virtue of my position as Chief Engineer of the State of Kansas, to be the Kansas representative on the committee to conduct the investigation.

5. That Mr. J. William McDonald, Director, Colorado Water Conservation Board, Department of Natural Resources, was designated by the Resolution as the Colorado representative on the investigation committee.

6. That by telephone conversation on April 10, 1985 and through an exchange of letters dated April 11, 1985 and May 2, 1985, I agreed with Mr. McDonald that each state would initially draft a scope of work concerning that state's allegations against the other state.

7. That these draft scopes of work were discussed at a meeting on May 7, 1985. For various reasons, Mr. McDonald disagreed with the scope of work which I had proposed as to how the committee should investigate Kansas' allegations.

8. That at the conclusion of the May 7, 1985 meeting, Mr. McDonald agreed to prepare and mail to me on May 21 or May 22 a proposed scope of work as to how Colorado would proceed to investigate the allegations made by the State of Kansas, including how to investigate the winter water storage program at Pueblo Reservoir.

9. By a letter which I received May 28, 1985, from Mr. McDonald, he proposed an entirely different plan of investigation for the Kansas allegations, including investigation of "Pueblo Dam and Reservoir, Winter Storage Program, and well development above John Martin Reservoir." The basic thrust of Mr. McDonald's proposed scope of investigation was to prepare a series of mass diagrams comparing flows at various gages for the periods 1949 to 1984. The purpose of this mass diagram analysis was merely to determine whether inflows to

John Martin Reservoir had declined and, if so, the extent of such declines. It was recognized by both of us that a mass diagram analysis could not determine the causes of such declines.

10. On June 3, 1985, the Committee met in Kansas City and agreed to temporarily defer consideration of a complete scope of work and to define a preliminary scope of work to include compilation of data and the construction of a series of mass diagrams which could be used to analyze changes in river flow at various points in the basin without committing either state to a final scope of work or to include any future analysis that might be needed.

11. That because the nature of the mass diagram investigation was to determine where reductions in flow had taken place, and the extent thereof, not to identify the causes of the reduction, the existence of items, such as the "Spronk Report," became irrelevant to the investigation until such time as a search for the causes of material depletion was resumed.

Further affiant says naught.

Dated this 24th day of January, 1989.

(Signed)
David L. Pope, P.E.
Chief Engineer-Director
Division of Water Resources
Kansas State Board of Agriculture

Subscribed and sworn to before me this 24th day of January, 1989.

/s/ DENISE J. ROLFS
Notary Public

My commission expires March 1, 1990.

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October Term, 1985

BEFORE THE HONORABLE ARTHUR L. LITTLEWORTH, SPECIAL MASTER

STATE OF KANSAS
Plaintiff,

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STATE OF COLORADO
Defendant.

KANSAS' RESPONSE TO COLORADO'S SECOND MOTION TO STAY

Introduction

Colorado has moved to stay any claim by Kansas that the operation of the winter water storage program has materially depleted the Arkansas River in violation of Article IV-D of the Arkansas River Compact "based upon Kansas' failure to exhaust administrative remedies." Motion to Stay, November 28, 1988. While Colorado suggests that the Arkansas River Compact Administration did not investigate the winter water storage program in Pueblo Reservoir, its motion to stay is not based on an alleged failure to investigate. Rather, Colorado argues its motion on two discrete grounds: 1) Kansas' "failure to present the Spronk report to the Compact Administration during the 1985 investigation;" and 2) Kansas' refusal "to review the decree for the winter water storage program unless

Colorado agreed that it was being submitted to the Compact Administration for its approval . . .." Brief in Support of Motion to Stay at 2. Notwithstanding all of the rhetoric, the motion to stay has no other basis.

A review of the "material facts not in dispute" results in three unequivocal conclusions: 1) the Arkansas River Compact Administration did investigate depletions caused by the winter storage program until that investigation was terminated by Colorado; 2) the Spronk report was made unnecessary and irrelevant to the administrative investigation by actions of Colorado; and 3) Kansas' refusal to review the winter storage decree in 1987 had no bearing on the administrative investigation in 1985. Once properly explained, the facts show that Kansas has exhausted its administrative remedies with respect to the winter water storage program in Pueblo Reservoir to the same extent that it has exhausted its remedies with respect to all of its other allegations of compact violations.

Statement of Facts

The Article VIII-H Administrative Investigation of the Winter Storage Program

Colorado's position is conspicuous for its ambivalence. In its brief in support of its motion to stay, Colorado suggests that the administrative investigation under Article VIII-H "did not specifically include the winter storage program . . .." *Ibid.* at 20. Colorado further states that "[i]t was not until Kansas filed its March 18, 1986 brief that Colorado learned that Kansas intended to assert that the winter storage program had adversely affected the regimen of the Arkansas River . . .." *Id.* at 24.

Colorado's understanding of the matter was different when the administrative investigation was being conducted and when the suit was filed. In its brief in opposition to the motion for leave to file of February 14, 1986, Colorado argued rather strenuously that the Court should not exercise its jurisdiction because the "Administra-

tion [had] agreed to investigate the operation of Pueblo Reservoir . . .." *Id.* at 19-20. More specifically, Colorado explained its role this way: "Furthermore, the Colorado representatives agreed in the resolution of March 28, 1985, to investigate the operation of the winter storage program in Pueblo Reservoir . . .." *Id.* at 19.

It is clear that the Arkansas River Compact Administration conducted an investigation of the winter water storage program until Colorado terminated the investigation on October 4, 1985.[1] On March 28, 1985, at Kansas' behest, the Administration formally resolved to promptly investigate:

> 1. Whether the waters of the Arkansas River have been or are being materially depleted in usable quantity or availability for use to the water users in Colorado and Kansas under the Compact by:
>
> a. the operation of the Trinidad Dam and Reservoir Project, Colorado,
>
> b. *the operation of Pueblo Dam and Reservoir, Colorado, and the winter water storage program on the Arkansas River in Colorado,*
>
> c. well development of the waters of the Arkansas River in Colorado, and
>
> d. well development of the waters of the Arkansas River in Kansas . . ..

Ex. No. 28 (L) (Emphasis added).

---

[1]Colorado asserts that no claim of material depletion as a result of the operation of the winter storage program in Pueblo Reservoir "was expressly made in Kansas' complaint." Brief in Support of Motion to Stay at 1. If the claim is not within the complaint, of course, the motion to stay is obviously unnecessary.

The allegation falls within ¶¶ 7-9 of the complaint. Detailed factual averments are not necessary under Rule 8. *Conley v. Gibson*, 355 U.S. 41, 47-48 (1957).

Pursuant to the Resolution, an Article VIII-H Investigation Committee was created. It subsequently met seven times. Before the first meeting in Denver on May 7, 1985, each state prepared a "scope of work" addressing its allegations. Colorado outlined the work necessary to investigate its allegations concerning the operation of Lake McKinney. Kansas outlined the investigation of the effects of post-compact wells and certain administrative practices and operations in Trinidad and Pueblo reservoirs, specifically including the operation of the winter water storage program in Pueblo Reservoir. *See* Ex. No. 29. The methodology adopted by the Investigation Committee and the exchanges that took place during its seven meetings in 1985 are detailed in Kansas' response to Colorado's original motion to stay. *Ibid.* at 11-15.

Colorado now argues that the Article VIII-H investigation did not purport to evaluate the effects of the winter storage program. Brief in Support of Motion to Stay at 20. As noted before, however, the Investigation Committee agreed to compile the requisite data and construct some fifty-four double and single mass diagrams to analyze changes in river flow. The Kansas and Colorado representatives failed to agree on the interpretation of the mass diagrams, including what the diagrams indicated regarding the flows at the gage labeled "Arkansas River at Las Animas," which measures flows in the reach where the winter water storage program takes place.[2] In this regard, the Kansas representative, David Pope, submitted a report entitled "Report to the Arkansas River Compact Administration Regarding the Article VIII(H) Investigation of Alleged Violations of the Arkan-

---

[2]The Fryingpan-Arkansas Project was designed to increase water supplies in the Arkansas River through transmountain importation, conservation of flood flows, and re-regulation of winter flows in Pueblo Reservoir. Act of August 16, 1962, P.L. 87-590, 76 Stat. 389, 43 U.S.C. § 616. It was contemplated that the ditches above John Martin Reservoir, *i.e.*, above the Las Animas gage, would forego winter diversions in exchange for the storage of the water in Pueblo Reservoir and certain other off-channel reservoirs. The object was to release the water during the irrigation season, thus optimizing its beneficial use.

sas River Compact," which presented Kansas' interpretation of the relevant mass diagrams, Figures 13 and 14:

> 4. The winter flows (November-March) of the Arkansas River at Las Animas have declined starting in about 1974. This decline is on the order of 5,000 to 7,000 acre-feet per season.
>
> 5. The flow of the Arkansas River at Las Animas declined during the 1949-1973 period by 112,000 acre-feet per year to 48% of the pre-compact average.
>
> 6. The declines in flow referred to above have exceeded those which would have been caused solely by the hydrologic variations which occurred during the 1970s and in part have been caused by factors other than hydrology.[3]

Ex. No. 47 at 22.

In the countervailing report of September 6, 1985, by William McDonald, the Colorado representative, Figures 13 and 14 were characterized quite differently, *i.e.*, as showing "[no] increased depletions to the flow of the Arkansas River at Las Animas ...." "Report to Investigation Committee of the Arkansas River Compact Administration" at 20. Apparently forgetting these engineering reports, Colorado asserts that "Kansas did not present any engineering studies to support further investigation of the winter storage program." Brief in Support of Motion to Stay at 22.

---

[3]Figure 13 was the double mass curve of the annual adjusted streamflow of the Arkansas River at Canon City plotted against the annual streamflow at Las Animas. Figure 14 was the double mass curve of the adjusted streamflow at Canon City for the winter storage season plotted against the streamflow at Las Animas for the winter storage season. Ex. No. 47 at 20.

The winter water storage program was also specifically treated in Mr. Pope's report on October 5, 1985, entitled "Supplemental Report to the Arkansas River Compact Administration Regarding the Article VIII (H) Investigation of Alleged Violations of the Arkansas River Compact," Ex. No. 35 at 33.

The Investigation Committee met on October 8, 1985, and each state presented its supplemental report and discussed its conclusions. *See* Transcript of Proceedings, October 8, 1985, Ex. No. 37; *see also* Ex. No. 35; Ex. No. 36. The Committee again recognized that each state had reached different conclusions about the meaning of the mass diagram analyses and the causes of the declines in stateline flows. Accordingly, they decided to submit the original and supplemental reports separately to the Administration.

As a result of the impasse, the Arkansas River Compact Administration adopted its Resolution of October 8, 1985, terminating the investigation except in the limited area of mutual agreement. *See* Ex. No. 37 at 35-38. The area of "mutual agreement" resulted from Kansas' willingness to investigate all of its allegations, as well as Colorado's, and Colorado's willingness to investigate only its own. The Resolution of October 8, 1985, recited that Kansas wished to continue the administrative investigation of, *inter alia*, the "post-compact development and use of upstream storage reservoirs . . .." Colorado refused to continue the investigation.

Presentation of the Spronk Report to the Compact Administration

Attempting to suggest that Kansas acted in bad faith, Colorado first asserts that Kansas' failure to provide the Spronk report vitiated the administrative investigation that was conducted pursuant to Article VIII-H. The facts, however, show that the existence of the Spronk report was known to the Compact Administration before the administrative investigation began. Because of Colorado's rejection of Kansas' proposed method of analyzing the winter storage program and the Investigation Committee's choice of a different method of analysis, the Spronk report was excluded from consideration by the Compact Administration.

Glossing over the history, Colorado states that "[i]t was not until Kansas filed its March 8, 1986 brief that Colorado learned that Kansas intended to assert that the winter storage program had

adversely affected the regimen of the Arkansas River based on the Spronk report." Brief in Support of Motion to Stay at 24. Feigning surprise, Colorado states that it "immediately requested a copy of the report." *Id.* A year earlier, however, when the administrative investigation was initiated by Kansas on March 28, 1985, Mr. Spronk gave a presentation of his report to the Administration. David Pope, the Chief Engineer-Director of the Water Resources Division, Kansas State Board of Agriculture, explained that Kansas had done some "preliminary engineering studies" of the depletions to the inflow to John Martin Reservoir from the operation of the winter water storage program in Pueblo Reservoir. Transcript of Meeting of March 28, 1985, Ex. No. 28 at 71. He then asked Mr. Spronk "to make some comments regarding the hydrology that they have done in this particular regard." *Id.*

With the draft report in his hands, Mr. Spronk proceeded to explain his analysis to the Compact Administration.[4] *Id.* at 71-77. He began by reviewing the nature of the program, explaining that the reregulation of native waters in Pueblo Reservoir was part of the Fryingpan-Arkansas Project. Mr. Spronk made it clear that the analysis that his firm had done for Kansas "centered on the program's effect on winter inflows," as opposed to annual inflows, and qualified his conclusions by stating:

> A concern that we have not yet investigated fully is that the true effects of the program may, indeed, be masked since 1975 as a result, primarily, of trans-mountain diversions into the Arkansas River Basin. These trans-mountain diversions have resulted in return flows which have accrued to the flows of the Arkansas River. These flows have potentially

---

[4]A comparison of pages 66-70, labeled "Conclusions and Recommendations" in the draft report (Ex. No. 96), with pages 71-77 of the transcript of the special meeting of March 28, 1985, shows that Mr. Spronk was reading from the draft report. It is essentially verbatim.

> offset or masked the total depletive effect of the winter water storage program.[5]

Transcript of Meeting of March 28, 1985, Ex. No. 28 at 75.

Mr. Spronk stated that the inflows to John Martin Reservoir during the winter storage season averaged 17,400 acre feet per year prior to the initiation of the program in 1976 and averaged 10,900 acre feet between 1976 and 1983. *Id.* at 75. He also stated his conclusion that the winter inflows to the conservation pool of John Martin had declined on the order of 4,600 to 6,500 acre feet per year since the program had been in effect. The same figures appear in the draft report. *Id.* at 76.

At the meeting on March 28, 1985, Colorado agreed to the investigation of the winter water storage program in Pueblo Reservoir and appointed an investigation committee. The Compact Administration's Investigation Committee held its first meeting on May 7, 1985, to discuss the scope of work for the investigation. Prior to the Committee meeting, the Colorado representative, Mr. McDonald, requested "a number of items by way of general background information for the investigation." The Spronk report was not requested. Minutes of the Investigation Committee, May 7, 1985, Ex. No. 29 at 2.

In regard to the operation of Pueblo Reservoir and the winter water storage program, Kansas proposed that the Investigation Committee:

1. Obtain all records and data showing historic diversions of winter flows by the participating entities in the winter water storage program.

2. Obtain and review all previous studies of the winter water storage program.

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[5]Colorado has also refused to investigate the extent to which transmountain returns have and are masking ongoing depletions of native Arkansas River waters.

3. Quantify storage occurring during 1976-1985 in the winter water storage program.

4. Determine how and when water stored in the winter water storage program was used.

5. Analyze water flows of the Arkansas River at the Las Animas gage, both before and after 1976, determining amounts apportioned between program water and the conservation pool of John Martin Reservoir.

6. Ascertain whether any changes in the flow of the Arkansas River at Las Animas are the result of variances in the hydrology of the Basin.

7. Quantify the impact of the program on inflow to conservation storage and determine whether Article IV (D) has been violated.

8. Prepare report.

Attachment B, Scope of Work — Kansas Allegations, Ex. No. 29 at 4.

After disagreeing with Kansas' proposed scope of work in regard to postcompact well development, the Colorado representative disagreed with Kansas' proposed investigation of the operation of the winter storage program, which would have involved the Spronk report.[6] Instead, Colorado proposed to rewrite the scope of work for consideration at the Investigation Committee's second meeting on June 3, 1985. *See* Ex. No. 108. *See also* Affidavit of David L. Pope at 2.

On June 3, 1985, the Investigation Committee adopted a procedure to compile streamflow data and to construct a series of single and double mass diagrams of the flows of the Arkansas River and the Purgatoire River. The purpose of the mass analyses was to determine whether there had been declines in stateline flows or inflows to John

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[6]Compare the "Purpose and Scope" of the Spronk report (Ex. No. 96 at 1-2) with the scope of work proposed by Kansas at the Investigation Committee meeting on May 7, 1985.

Martin Reservoir. This methodology was considerably broader and more generalized than the investigation Kansas had proposed and did not involve analyses of discrete causes of depletion. At this point the Spronk Report became irrelevant because of the broadened procedures. *See* Affidavit of David L. Pope at 3. The Committee agreed that if the diagrams indicated that depletions had in fact occurred, further studies would be undertaken to ascertain the causes. Minutes of Meeting of Investigation Committee, June 3, 1985, Ex. No. 30.

As has been explained previously, the mass diagrams showed substantial declines in postcompact stateline flows. After the mass diagrams were presented, however, considerable discussion ensued as to the causes of the declines. Because the states disagreed over the substance of the diagrams, it was finally decided that each would prepare a report explaining its interpretation of the data and the diagrams. *See* Minutes of Meeting of Investigation Committee, July 12, 1985, Ex. No. 32.

The end result was Colorado's refusal to undertake any further study or investigation of the operation of Pueblo Reservoir and the winter water storage program. *See* Resolution of October 8, 1985, Ex. No. 37. Had Kansas' proposed method of investigation been followed, the Spronk Report would have been useful to the Compact Administration's Investigation Committee. As it turned out, Colorado terminated the investigation before the winter storage program would have been studied individually as a cause of depletions to John Martin inflows.

Failure to present a written draft to the Committee or the Compact Administration did not vitiate the investigation. Instead, Colorado arbitrarily terminated the investigation without studying the winter storage program as a cause of depletions to John Martin inflows because it refused to recognize that man-made depletions had occurred. *See* Kansas' Response to Colorado's Motion to Stay, June 14, 1988, at 5-19. It is clear that the attempts by Kansas to investigate depletions caused by the winter storage program were blocked by

Colorado's actions. Colorado can not have it both ways. It can not control the course of the investigation by adopting a mode of analysis that excluded the Spronk report and subsequently complain that the investigation was ineffective because the Spronk report was not utilized.

The Submission of the Spronk Report

Continuing to make a cat's paw of the Spronk report, Colorado explains one side of the history to the Special Master. The chronology shows that the actions complained of by Colorado occurred one year after the termination of the investigation.

In September, 1985, counsel for Colorado agreed in a telephone conversation to provide counsel for Kansas with a copy of a groundwater study or "well inventory" by Mr. Ron Thaemert. Ex. No. 93. On March 23, 1986, a year after the Spronk report had been introduced to the Compact Administration, Colorado requested copies of two studies cited by Kansas in its reply brief of March 4, 1986, one of which was the Spronk report. Ex. No. 90. Though the Spronk report had been reviewed at the Compact Administration meeting on March 28, 1985, it was withheld at the time because it had not been completed.

At the status conference held by Judge McCree on August 20, 1986, Kansas submitted a proposed pretrial order that included a specific description of each of the studies that Kansas intended to undertake in preparation for the litigation. Ex. No. 101 at 4-5. Kansas also requested a similar description of the engineering studies that Colorado intended to undertake. Transcript of Status Conference, August 20, 1986, Ex. No. 102 at 33. Colorado refused, explaining that it was a defendant and did not know the nature of its studies at the time. *Id.* at 34-37, 44.

While Kansas also stated its desire to be informed of studies already undertaken, specifically the Thaemert "well inventory," the Special Master relied on a "gentlemen's agreement" to describe the

studies as soon as possible. *Id.* at 45. The Master specifically directed counsel for Colorado to write a letter regarding the groundwater study. Colorado agreed to this request. *Id.* at 47.

Shortly after the conference, Kansas decided to release the Spronk report, notwithstanding that the report had not been completed. Inadvertently, counsel released a study with the same title, *i.e.*, "Evaluation of the Arkansas River Winter Water Storage Program in Colorado," prepared by Mr. Spronk when he was with the firm of Simons, Li & Associates. *See* Ex. No. 93 at 1.

Subsequently, having not been provided with the well inventory, counsel decided to withhold the Spronk report until the two reports could be exchanged:

> We cannot release the Spronk report because the report exists only in draft form. However, if you are willing to release your well study, which Hal Simpson last referred to as a "well inventory," we would consider the possibility of exchanging reports sometime within the next six to eight weeks.

Ex. No. 22 at 1. Counsel had hoped that the Spronk report could be completed within the time stated.

Budgetary constraints made it impossible to complete the report. In any event, on June 3, 1987, counsel for Kansas tired of the cat and mouse game and released the report even though it had not been completed. At the same time, Kansas again requested the Colorado ground water study. Ex. No. 93.

Since then, Kansas has repeatedly asked for the Thaemert study, relying on the fact that it was initially promised in September, 1985. Finally, on November 11, 1988, Kansas formally requested a copy of the Thaemert report in its First Request to Produce Documents to the State of Colorado. On January 12, 1989, counsel for Kansas inquired about the status of Colorado's response to the request for production, asking specifically if the Thaemert report would be produced. Counsel for Colorado stated that it would be produced. On

January 17, 1989, Colorado formally responded to the request, withholding the report on the theory that it was done in anticipation of litigation.[7]

The Alleged Benefits of the 1980 Resolution Transit Loss Account

Colorado has also risen above the facts by divining that the Spronk report was withheld because it "concluded that there may have been some decline in inflow to John Martin Reservoir, but advised that Kansas might not benefit from raising the issue ...." Brief in Support of Motion to Stay at 24. While this supposition is irrelevant to its motion to stay, it nonetheless requires a response. Colorado confuses the facts by supplanting the issue of the winter water storage program in Pueblo Reservoir with a lengthy and misleading apologue about the transit loss account in John Martin Reservoir. *See* Brief in Support of Motion to Stay at 5-11.

Specifically, Colorado asserts that "[u]nder the 1980 operating plan, a portion of the water stored in John Martin Reservoir under the winter storage program has been used for the Kansas transit loss account" and that Kansas "did not want to risk renegotiation of the operating plan by suggesting modifications to the winter storage program." *Id.* at 25 and 2. The fact of the matter is that the "benefits" from the 1980 operating plan for John Martin Reservoir are part of Kansas' entitlement under the Compact. *Cf.*, Motion to Refer Motion for Leave to Amend Complaint, January 27, 1989. Kansas has also been advised that the 1980 Resolution is quite possibly *ultra vires, i.e.*, it is a legally ineffective amendment of Article V of the Arkansas River Compact. Its "renegotiation" has never been a concern of Kansas.

A brief explanation of Article V-E-3 is necessary to an understanding of the 1980 Resolution. Article V-E-3 provides that "[r]eleases of

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[7]Kansas will file a motion to compel production in due course.

river flow and of stored water to Colorado shall be measured by gaging stations at or near John Martin Dam *and the releases to which Kansas is entitled shall be satisfied by an equivalent in state-line flow.*" (Emphasis added). The provision benefited Kansas in that it mandates that transit losses will be borne by Colorado, and it benefits Colorado in that Colorado can make the delivery with "equivalent . . . state-line flow." The effect is that Colorado can charge Kansas for its full demand without having to release the entire amount.

The provision as it relates to the 1980 Resolution has to be understood in the context of changing hydrologic conditions. When Article V was written, the reach of the Arkansas River between John Martin Reservoir and the stateline was a gaining stream, largely from surface water return flows and from ground water inflow or accretions. Because the river was a gaining river, Colorado was given the alternative of providing releases to Kansas in part from the accretions and returns. Thus, Colorado didn't have to release all of the molecules of water to which Kansas was entitled, plus a cushion for transit losses, but could deliver "equivalent" water.

By 1974, the flows of the Arkansas River had dropped off by approximately 70%. Due primarily to the proliferation of postcompact wells below John Martin Reservoir, the river was no longer a gaining river, but was often dry in different parts of the reach. Colorado's failure to regulate the river by the internal administration of Colorado law made it physically impossible for requested releases to reach the stateline. For example, between April 5-10, 1976, a release was made of 10,800 acre feet from John Martin at a rate of 1,000 cfs. The total loss down to the stateline was 2,373 acre feet. Colorado's 60% share was 6,480 acre feet. Colorado ditches diverted 6,505 acre feet. The flow at the stateline was 1,970 acre feet, resulting in a loss to Kansas of 54% of its entitlement. Although Colorado acknowledged its duty, it failed in its responsibility for delivery.

After numerous complaints and discussion of the matter by the Arkansas River Compact Administration, Colorado sought to solve the problem in part by issuing an administrative order pursuant to

Colorado law and Article V of the Arkansas River Compact requiring Colorado ditches to bypass releases of water for Kansas. When the ditches deliberately violated the order by diverting water during the initial release, Colorado filed a complaint and application for injunction. The complaint alleged that the actions of the defendants, the Amity Mutual Irrigation Company and the Buffalo Mutual Irrigation Company, had made it impossible for Colorado to abide by Article V-E-3 of the Compact. The complaint was authored by David Robbins, when he was an assistant attorney general in Colorado in the Natural Resources Section. *See* Ex. No. 103, Complaint, *Colorado v. Amity Mutual Irrigation Company and Buffalo Mutual Irrigation Company*, Civil No. W-4764, Water Division No. 2, August 16, 1978. At trial, it was argued:

> In this matter, your Honor, the State is seeking an Order from the Court upholding its authority to issue orders to allow the State to meet its obligations under the Arkansas River Compact. We believe that reading of the Compact which is codified at 37-69-101 of the Colorado Revised Statutes shows that if Kansas makes a call for the water it is entitled to 400 cubic feet per second measured at the State line. The provisions which provide for that are, I believe, found in Article V, Sub E, Sub (3) of the Compact. That provision specifies that measurements for the flow for Kansas is to be measured at the State line, whereas Colorado's flow is measured just below John Martin Dam. It is also our opinion that the State water officials, that is to say, the State Engineer and Division Engineer and appropriate Water Commissioners, are the proper officials to enforce the obligations of the State of Colorado under the Compact . . .."

Transcript of Proceedings, Case No. W-4764, Ex. No. 104 at 120-21.

Because the case focused solely on two ditches in District 67, the water court ruled that the state engineer had acted discriminatorily.[8] Ex. No. 105, Findings of Fact at 8. The court found that there were approximately 5,000 surface decrees, nearly 5,000 well diverters, and almost 5,000 stock ponds in District 67 alone. Colorado did not seek to enjoin these uses. The court dismissed the complaint on equal protection grounds, further observing that "[i]t is clear that junior underground water decrees developed after the ratification of the Compact have materially depleted in usable quantity and availability the waters of the Arkansas River for use to water users in Colorado and Kansas." Ex. No. 105 at Section V.

The State of Colorado appealed. Because of concern over the implications of the district court's decision and the imminent possibility of interstate litigation, however, Colorado decided to abandon the appeal as it related to administration under the Compact. Colorado stated: "In the course of preparing [the] appeal, new evidence was discovered which established that the water commissioner's order to the ditches of water district 67 was based on an erroneous interpretation of the Arkansas River Compact." Ex. No. 106, Opening Brief, Colorado Supreme Court No. 81 SA 467 at 2. The brief was authored by Dennis Montgomery, who had become an assistant attorney general for Colorado in the Natural Resources Section. Sensitive to the political problem, the Colorado Supreme Court agreed that the water judge "improperly took judicial notice that

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[8]Amity raised twelve affirmative defenses, three of which were critical to the district court's ultimate ruling: 1) that the duty to deliver water to Kansas should be imposed equally on all diverters in the Arkansas River Basin; 2) that Colorado itself had caused the problem by: a) not enforcing water rights decrees, particularly ground water rights, under the prior appropriation doctrine; b) adopting inaccurate and artificial transit and evaporation losses; c) allowing out-of-priority storage in Pueblo Reservoir; d) permitting the unregulated construction of stock ponds; e) failing to adopt rules and regulations respecting ground water uses; and f) failing to make regulations for the distribution of the releases under the Compact; and 3) that Colorado itself had destroyed the regimen of the river. The district court agreed with Amity.

stock ponds and wells developed after ratification of the Arkansas River Compact have materially depleted the waters of the Arkansas River." *Id.* at i; Ex. No. 107, Opinion at fn. 3. Nonetheless, the Supreme Court affirmed the district court's judgment.

With the transit loss problems in Colorado and the convergence of other factors, such as the desire to create a permanent pool in John Martin Reservoir for fish, wildlife, and recreational purposes, the Compact Administration recognized the possible benefits of changes in John Martin operations. The Administration's discussions culminated in the Resolution of April 24, 1980, which created storage accounts in John Martin for Kansas, for the ditches in Colorado Water District 67, and for other Colorado ditches. Paragraph III(D) created the "Kansas Transit Loss Account." The account was supplied by waters obtained from Amity Mutual Irrigation Company, by an agreement allowing Amity to transfer part of its storage water decree to John Martin Reservoir. Amity agreed to supply 35% of the transferred water that it otherwise could have stored in the Great Plains Reservoir system.[9]

The transit loss account created by the 1980 Resolution is a misnomer. Article V-E-3 requires that Kansas' entitlement be measured at the stateline. The responsibility for transit losses rests squarely on Colorado. The transit loss account simply helps Colorado make its required deliveries, which does not embarrass Kansas. The

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[9]The Great Plains system was extremely inefficient, with most of the water stored being lost to evaporation. At the Compact Administration meeting on May 5, 1976, Bill Hund of the Amity Canal stated that they had done a thirty-six year study on the Great Plains reservoirs and concluded that they received fifty-one percent of the water out of the reservoirs that was diverted into them. *See* Transcript of Proceedings, Arkansas River Compact Administration, May 5, 1976 at 23. Amity actually received a significant net gain by its agreement to contribute 35% of its water to the Kansas transit loss account.

alleged "benefit" to Kansas is something Kansas is entitled to under the Compact.[10] Colorado is simply wrong in deciphering that Kansas wilfully withheld the Spronk report because it jeopardized Kansas' "benefits" under the 1980 operating plan. The theory is cute, but it is nonsense.

Review of the Winter Water Storage Decree

Colorado argues that Kansas' refusal in November, 1987, to review the Colorado Water Court's winter storage decree "created an impasse which has prevented the Compact Administration from carrying out a review of the winter storage program." The administrative investigation of the winter storage program under Article VIII-H, however, was terminated by Colorado on October 8, 1985.[11]

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[10]There are only two references in the 1980 Resolution which refer to the winter storage program in Pueblo Reservoir. Paragraphs III(B) and III(C) establish storage accounts in John Martin Reservoir for the Fort Lyon Canal Company and Las Animas Consolidated Canal Company. The water to be stored in these accounts is delivered to John Martin "under an approved Pueblo winter storage plan . . . the delivery cannot include water that otherwise would have accumulated in conservation storage." In its brief, Colorado suggests that all "other water" stored in John Martin Reservoir in accordance with Paragraph III of the 1980 Resolution is somehow tied to or associated with the winter storage program. However, the account established for the Amity Canal Company makes no reference to "an approved Pueblo winter storage plan" as do the accounts for Fort Lyon and Las Animas.

[11]Colorado predicates its argument on Kansas' "legal position on the 1951 Resolution," *i.e.*, that it requires that the Compact Administration approve any plan of reregulation of native waters. The legal position, however, has nothing to do with whether Kansas sought an administrative investigation of whether the storage program has depleted inflows into John Martin. That position is treated in Kansas' Response to Colorado's Motion for Partial Summary Judgment.

ARGUMENT

POINT I

A STATE IS REQUIRED TO EXHAUST ITS ADMINISTRATIVE REMEDIES ONLY ONCE.

The record shows that Kansas has made a reasonable, good faith effort to exhaust administrative remedies before the Arkansas River Compact Administration with respect to depletions caused by the winter water storage program. *See* pp. 5-9, above; Kansas' Response to Motion to Stay, June 14, 1988, at 6-19. That effort was frustrated by the political structure of the Arkansas River Compact Administration, which allowed Colorado to exercise its veto power to prevent an investigation of the allegations in the March 28, 1985 Resolution. Accordingly, further efforts at exhaustion would be futile.

The futility of administrative proceedings is a recognized exception to the exhaustion requirement. As one commentator put it: "To insist, as a prerequisite to judicial relief, that those aggrieved first pass through the very procedures that are discriminatory would be to require an exercise in futility." Bernard Schwartz, *Administrative Law* § 8.31 at 505-506 (2nd ed. 1984). Kansas agrees that the policy considerations for exhaustion which have been restated by Colorado are correct. But these policies can be realized only if the administrative forum is structured in a manner which allows their realization.

The cases are clear. In *Camenisch v. University of Texas*, 616 F.2d 127, 134 (5th Cir. 1980), the Court held that "[i]t is well-settled that where there is no adequate administrative procedure available, the exhaustion doctrine does not apply. *Bossier Parish School Board v. Lemon*, 370 F.2d 847, 852 (5th Cir. 1967), *cert. denied* 388 U.S. 911, 87 S.Ct. 2116, 18 L.Ed. 2d 1350 (1967)." Because the inadequacy of the Arkansas River Compact Administration's procedures are the problem, further invocation of those procedures is both pointless and

injurious to Kansas. As the court held in *American Federation of Government Employees v. Acree*, 475 F.2d 1289 (D.C. Cir. 1973):

> But there are cases where the customary rationales for the exhaustion of administrative remedies doctrine — avoidance of unnecessary judicial intervention and the need for full, unhampered exercise of agency expertise on a well developed factual record of its own making, *see, e. g.*, McKart v. United States, 395 U.S. 185, 193-195, 89 S.Ct. 1657, 23 L.Ed.2d 194 (1969) — do not apply and the doctrine's application thus become pointless. In some cases the doctrine is no more than "an exercise in futility," *see* Lodge 1858, American Federation of Government Employees v. Paine, 141 U.S.App.D.C. 152, 166, 436 F.2d 882, 896 (1970), particularly where it is clear beyond doubt that the relevant administrative agency will not grant the relief in question. *See* Montana National Bank of Billings v. Yellowstone County, 276 U.S. 499, 48 S.Ct 331, 72 L.Ed. 673 (1928).

475 F.2d at 1292. Kansas' experience before the Compact Administration has resulted only in Colorado's refusal to participate.

Colorado's citation of legal authority is based on the erroneous premise that Kansas provoked an impasse in the Article VIII-H investigation by failing to "reasonably" pursue the 1985 investigation. Accordingly, the cases are inapposite. The facts show that Kansas' efforts to obtain an Administration investigation of the five issues in the March 28, 1985 Resolution were repeatedly frustrated. *See* pp. 5-9, above; Kansas' Response to Motion to Stay, June 14, 1988, at 6-19 Brief. For example, Colorado cites *National Conservative Political Action Comm. v. Federal Election Comm'n.*, 626 F.2d 953, 957 n.8 (D.C. Cir. 1980). In that case, however, the court was addressing a circumstance in which the claimant had refused to appear before the administrative agency. As the court noted ". . . the first time the Commission was confronted with appellants' objections to the Commission's regulation was in the district court." 626 F.2d at 957. Similarly, in *Seafarers Intern. v. United States Coast Guard*, 736

F.2d 19, 26 n.11 (2nd Cir. 1984), the Court observed that "[e]xhaustion analysis is relevant to our holding on justiciability because Seafarers' failure to exhaust or even engage in administrative review has left the factual record so undeveloped that the case is not ripe for judicial review . . .." Both cases address the situation in which administrative review was evaded. In this case, administrative review was not evaded by Kansas, but rather was frustrated by Colorado.

Colorado also cites two cases for the proposition that claims not presented to an administrative agency may not be made for the first time to a reviewing court. *Plaquemines Port, Harbor and Terminal Dist. v. Federal Maritime Comm'n.*, 838 F.2d 536, 551 (D.C. Cir. 1988); *Washington Ass'n. for Television & Children v. FCC*, 712 F.2d 677, 680 (D.C. Cir. 1983). Neither is precedent for the circumstances presented here, where Kansas made a clear effort to obtain review of the winter storage program by the Compact Administration prior to filing suit. Ironically, Colorado has cited *Bethlehem Steel Corp. v. E.P.A.*, 669 F.2d 903 (3rd Cir. 1982). That case held that "the doctrine of administrative exhaustion should be applied with a regard for the particular administrative scheme at issue." 669 F.2d at 906. The administrative scheme at issue here has resulted in the necessity of an original action.

As in *Texas v. New Mexico*, 462 U.S. 554 (1983), the Court's original jurisdiction in this case was invoked by Kansas only when administrative procedures provided by Compact proved unworkable. As the Special Master concluded in his opinion of October 21, 1988, the Court has "intimated that 'fundamental structural considerations,' such as an interstate compact that accords each signatory state the power to veto authoritative commission action, may abbreviate inquiry into the question of whether an available remedy exists at the administrative level." It is clear that further analysis of the winter storage program in Pueblo Reservoir by the Compact Administration is futile.

POINT II

IT WOULD BE ANALYTICALLY IMPRACTICAL TO SEPARATE DEPLETIONS OF ARKANSAS RIVER FLOWS CAUSED BY THE WINTER WATER STORAGE PROGRAM FROM THE ISSUES SET FOR TRIAL.

Quite aside from the law and the fact that Kansas has exhausted its administrative remedies with respect to the winter water storage program, the impact of the program on streamflow at the stateline cannot be evaluated accurately in isolation from the consideration of other effects on stateline flows. Hydrologically, individual factors contributing to decreased stateline flows cannot be analyzed separately. Instead, the analysis of one cause requires the simultaneous consideration of the interactions among other causes.

Institutional arrangements and the stream system hydrology must be evaluated together to be conclusive about causes of depletion. Institutional arrangements, such as the winter water storage program, combine hydrodynamically with other institutional actions, such as pumping from alluvial wells along the Arkansas River, to produce a net hydrologic result. In this case the result is reduced stateline flows. Accordingly, the impact of the winter water storage program can be identified only by considering that program within the context of all causes of depletion in the overall hydrologic system, both natural and man-made.

The institutional system in the Arkansas River Basin is comprised of arrangements that govern the operation of surface water reservoirs, the direct diversion of surface water, and the pumping of groundwater. The hydrologic system consists of the surface water and groundwater subsystems. Relationships exist within and between the institutional and hydrologic systems. Examples of the relationships within the hydrologic system include groundwater returns to the Arkansas River which contribute to streamflow and streamflow which provides groundwater recharge. Interaction between the institutional and hydrologic systems include groundwater pumping which

affects streamflow, which affects surface diversions. In turn, surface diversions affect groundwater pumping.

The winter water storage program produces effects that are the result of such relationships. The program is designed to reduce winter diversions for irrigation and to increase storage in the program reservoirs. It leads to five results: The decrease of storage in non-program accounts in John Martin Reservoir; the increase of the summer supply for Colorado from the program reservoirs; the decrease of the summer supply for Kansas and Colorado from non-program accounts in John Martin Reservoir; the increase of summer pumping in Colorado, owing to reduced winter storage in John Martin Reservoir; and decreases of summer pumping, owing to the increased winter storage in the program reservoirs. These institutional and hydrologic actions and reactions combine to produce a particular effect on streamflow at the stateline. The effect can be identified only by considering all of the relationships within and among the systems.

The State of Kansas is pursuing investigations that address these relationships. The issues are being addressed through the development and use of two types of models. The first is a descriptive model for the analysis of hydrologic data. This model is based on water budgets for various components of the hydrologic system. The second is a prescriptive model to simulate the relationships within and between the hydrologic and institutional systems. This model is based on both the hydrodynamic relations that describe the hydrologic system and on the administrative rules that comprise the institutional system. These models are being used conjunctively to identify and quantify the causes and affects of the depletion of streamflow at the stateline. Both models require that all of the institutional actions that potentially effect state-line flow be considered simultaneously. Accordingly, the winter water storage program must be included in the analysis that will be presented to the Master. For the Special Master to receive this factual evidence, of necessity,

yet preclude it from the legal dimension of his opinion, as Colorado proposes, would not be feasible.

CONCLUSION

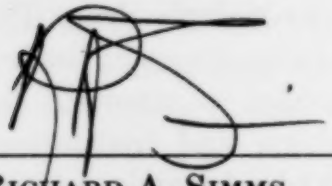
In deciding this motion we ask the Special Master to consider the Greek saying that those whom the Gods wish to destroy they first make mad. In our circumstance, those whom the Gods wish to destroy they first require to perpetually exhaust administrative remedies before the Arkansas River Compact Administration.

Respectfully submitted,

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No. 105 Original

In The Supreme Court

Of The United States

STATE OF KANSAS
Plaintiff,

v.

STATE OF COLORADO
Defendant.

CERTIFICATE OF SERVICE

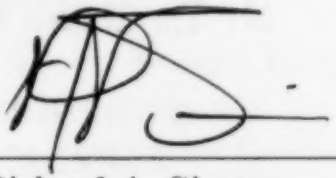
I, Richard A. Simms, hereby certify that I caused to be mailed three copies of the foregoing Kansas' Response to Colorado's Second Motion to Stay to be served by first-class mail on the following this 27th day of January, 1989:

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(2)

Supreme Court, U.S.
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No. 105, Original

IN THE

Supreme Court of the United States

October Term, 1985

Before The Honorable Arthur L. Littleworth,
Special Master

STATE OF KANSAS
Plaintiff,

v.

STATE OF COLORADO
Defendant,

and

UNITED STATES OF AMERICA
Defendant-Intervenor.

FIRST AMENDED COMPLAINT

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Special Master

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Plaintiff,

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UNITED STATES OF AMERICA

Defendant-Intervenor.

FIRST AMENDED COMPLAINT

The State of Kansas, by its Attorney General, the Honorable Robert T. Stephan, brings this suit against the Defendant, State of Colorado, and for its cause of action states:

1. The jurisdiction of the Court is invoked under Article III, Section 2, Clause 2 of the Constitution of the United States and Paragraph (a), Section 1251, Title 28 of the United States Code.

2. The Arkansas River is an interstate river which rises near Leadville, Colorado and flows south to Salida, Colorado, east through Canon City and Pueblo, and across southeastern Colorado into the State of Kansas.

3. In order to resolve existing and future controversies and to divide and equitably apportion the water of the Arkansas River, Congress consented to the negotiation of a compact by the states of Colorado and Kansas. Act of April 19, 1945, 59 Stat. 53. Subsequently, the Arkansas River Compact was ratified by the State of Colorado by the

Act of February 19, 1949, Colo. Rev. Stat. 1963, § 149-9-1; the State of Kansas ratified the Compact by the Act of March 7, 1949, Kansas Gen. Stat. Ann. 1964, § 82a-520. The Compact was approved and enacted into federal law by the Act of Congress of May 31, 1949, 63 Stat. 145. A copy of the Arkansas River Compact was attached as Appendix A to the original Complaint in this action.

4. The principal purpose of the Arkansas River Compact was to "[e]quitably divide and apportion ... the waters of the Arkansas River and their utilization as well as the benefits arising from the construction, operation and maintenance by the United States of John Martin Reservoir Project for water conservation purposes." 63 Stat. 145, 145, art. I.

5. While expressly recognizing the possibility of offsetting postcompact development of the waters of the Arkansas River by new regulation or increased efficiency, the Compact mandates "that the waters of the Arkansas River, as defined in Article III, shall not be materially depleted in usable quantity or availability for use to the water users in Colorado and Kansas ... by such future development or construction." 63 Stat. 145, 147, art. IV(D).

6. The Compact provides that "Colorado shall administer the decreed rights of water users in Colorado Water District 67 as against each other and as against all rights now or hereafter decreed to water users diverting upsteam from John Martin Dam on the basis of relative priorities...." 63 Stat. 145, 148, art. V(F).

7. Through the actions of its officers, agents and political subdivisions, the State of Colorado and its water users have materially depleted the usable and available stateline flows of the Arkansas River since the adoption of the Compact.

8. In spite of its duties and obligations under the Compact, since 1949 the State of Colorado has allowed and permitted substantial increases in the diversion and use in Colorado of the surface and hydrologically related ground

waters of the Arkansas River, without the concomitant regulatory or conservation measures that the Compact requires to protect the states against material depletions in usable stateline flows.

9. The lack of effective administrative practices in Colorado has encouraged rather than retarded the development of postcompact depletions of the waters of the Arkansas River Basin and has resulted in ongoing, material depletions of the usable flows of the Arkansas River and substantial and irreparable injury to Kansas water users.

10. For more than twenty years, the State of Colorado has investigated and known the impact of the ground water appropriations in the Arkansas River Basin in Colorado. Approximately 150,000 acre feet per year of ground water related to the Arkansas River has been appropriated in Colorado since 1949, and the State of Colorado has intentionally disregarded the findings of its investigations to the effect that such appropriations directly and materially reduce the usable flow and availability of the Arkansas River in Colorado and Kansas. By its acquiescence in the postcompact proliferation of ground water diversions and its failure to administer the priorities of postcompact ground water diversions with existing surface diversions, Colorado has breached and continues to breach its obligations and responsibilities under the Arkansas River Compact.

11. Since the adoption of the Compact, the State of Colorado has attempted to unilaterally impede the bilateral action of the Compact Administration intended to protect Kansas' Compact apportionment and has failed to apply and administer its internal laws in order to meet its obligations under the Compact.

12. Pursuant to Article VIII(H), the Arkansas River Compact Administration has conducted an investigation of alleged Compact violations. The State of Colorado, however, through its Compact Commissioner, has rejected and continues to reject the State of Kansas' requests to investigate the impact on the Arkansas River of: 1) Colorado's

substantial, postcompact ground water depletions of surface flows at the stateline; 2) the failure of Colorado to administer ground water priorities against surface priorities; 3) Colorado's artificially transferring water from the storage pool in Trinidad Reservoir to the sediment pool and then refilling the storage pool to the detriment of downstream users; 4) the consequences of future increases in the consumption of Colorado's transmountain return flows; and 5) Colorado's unilateral rejection of the Arkansas River Compact Administration's Resolution of July 24, 1951, requiring that any reregulation of the native water of the Arkansas River be approved by the Compact Administration. Additionally, the State of Colorado refuses to enjoin its postcompact ground water appropriations and resulting surface depletions during the pendency of investigation of the effects of such appropriations, in spite of the irrefutable fact that those appropriations materially deplete the usable and available flows of the Arkansas River. Accordingly, the State of Colorado has used and will continue to use the pending administrative investigation as the basis for prolonging the substantial and irreparable injury to the State of Kansas by wrongfully depriving the State of Kansas and its citizens of the waters of the Arkansas River to which they are entitled under the Compact.

13. The State of Colorado has failed and continues to fail to make deliveries of releases to which Kansas is entitled from John Martin Reservoir by an equivalent in stateline flow, as required by Article V(E)3 of the Compact, and in violation of Articles V(E)4 and V(H)2.

14. Grave and irreparable injury to the State of Kansas and its citizens who were entitled to receive and use the water apportioned to them by the Arkansas River Compact has been caused by the acts and conduct of the State of Colorado, its officers, citizens, and political subdivisions in failing, neglecting, and refusing to deliver water to Kansas in the usable and available quantities apportioned to it by the Compact.

15. Grave and irreparable injury will be suffered in the future by the State of Kansas and its citizens unless relief is afforded by this Court to prevent the State of Colorado, its officers, citizens, and political subdivisions from using and withholding water which Kansas is entitled to and which Colorado has heretofore agreed to deliver pursuant to the terms and provisions of the Arkansas River Compact.

16. The State of Kansas has sustained damages as follows:

(a) General damages arising from breach of the Arkansas River Compact by the State of Colorado, consisting of the value of Kansas' apportioned share of the Arkansas River lost to Kansas as a result of Colorado's depletions of the Arkansas River resulting from its violations of the Arkansas River Compact in an amount to be proved at trial.

(b) Special damages arising from breach of the Arkansas River Compact by the State of Colorado consisting of depletions of the Ogallala aquifer, a non-renewable resource, in the State of Kansas, resulting from Colorado's violations of the Arkansas River Compact in an amount to be proved at trial.

17. The State of Kansas has no effective remedy to enforce its rights under the Arkansas River Compact against the State of Colorado other than through the exercise of original jurisdiction in this case.

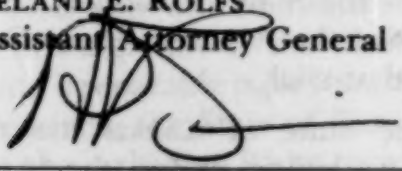
WHEREFORE, the State of Kansas respectfully prays that the Court issue its decree commanding the State of Colorado, its officers, citizens, and political subdivisions to deliver the waters of the Arkansas River in accordance with the provisions of the Arkansas River Compact and providing for such other and further relief as the Court may deem appropriate; and WHEREFORE, the State of Kansas prays that the Court award all general and special damages resulting from violations of the Arkansas River Compact by the State of Colorado, and for all other relief that the Court deems just and proper.

Respectfully submitted,

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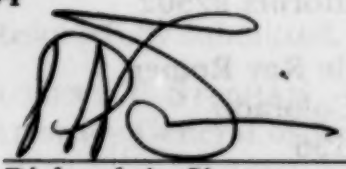
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No. 105, Original

IN THE
Supreme Court of the United States

October Term, 1985

STATE OF KANSAS,
Plaintiff,

v.

STATE OF COLORADO,
Defendant,

and

UNITED STATES OF AMERICA,
Defendant-Intervenor.

COLORADO'S ANSWER TO THE FIRST AMENDED COMPLAINT AND COUNTERCLAIM

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COLORADO'S ANSWER TO THE FIRST AMENDED COMPLAINT AND COUNTERCLAIM

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CONSTITUTION:

U.S. Const., Art. III, §2, Cl. 2 5

ANSWER

Defendant, the State of Colorado, for its answer to the First Amended Complaint filed in the above-captioned action by Plaintiff, the State of Kansas, states:

1. Colorado admits the Court has jurisdiction under the allegations in paragraph 1 of the First Amended Complaint. Colorado denies that this is an appropriate case for the Court to exercise such jurisdiction because Kansas has failed to exhaust its administrative remedies under Article VIII of the Arkansas River Compact.

2. Colorado admits the allegations in paragraph 2 of the First Amended Complaint.

3. Colorado admits the allegations in paragraph 3 of the First Amended Complaint.

4. Colorado admits that one of two major purposes of the Arkansas River Compact is quoted in paragraph 4 of the First Amended Complaint. Colorado denies the allegations of paragraph 4 insofar as they assert that the purpose set forth in Article I-B of the Compact is the "principal" purpose of the Arkansas River Compact.

5. Colorado admits that a portion of Article IV-D of the Compact is quoted in paragraph 5 of the First Amended Complaint. Colorado denies the allegations of paragraph 5 insofar as they assert Kansas' interpretation of Article IV-D.

6. Colorado admits that a portion of the first sentence of Article V-F of the Arkansas River Compact is quoted in paragraph 6 of the First Amended Complaint. The first sentence of Article V-F in its entirety reads as follows:

> In the event the Administration finds that within a period of fourteen (14) days the water in the conservation pool will be or is liable to be exhausted, the Administration shall forthwith notify the State Engineer of Colorado, or his duly authorized representative, that commencing upon a day certain within said fourteen (14) day period, unless a change of conditions justifies

cancellation or modification of such notice, Colorado shall administer the decreed rights of water users in Colorado Water District 67 as against each other and as against all rights now or hereafter decreed to water users diverting upstream from John Martin Dam on the basis of relative priorities in the same manner in which their respective priority rights were administered by Colorado before John Martin Reservoir began to operate and as though John Martin Dam had not been constructed.

Colorado affirmatively alleges that the Arkansas River Compact Administration by resolution in 1980 adopted an operating plan for John Martin Reservoir which modifies the method by which the Administration finds that the water in the conservation pool is exhausted for the purposes of Article V-F.

7. Colorado denies the allegations in paragraph 7 of the First Amended Complaint.

8. Colorado denies the allegations in paragraph 8 of the First Amended Complaint.

9. Colorado denies the allegations in paragraph 9 of the First Amended Complaint.

10. Colorado admits that for more than twenty years its agencies or officials have investigated ground water appropriations in the Arkansas River Basin in Colorado. Colorado denies the remaining allegations of paragraph 10 of the First Amended Complaint.

11. Colorado denies the allegations in paragraph 11 of the First Amended Complaint.

12. Colorado admits that the Arkansas River Compact Administration was in the process of conducting an investigation of alleged Compact violations pursuant to Article VIII-H of the Arkansas River Compact at the time Kansas commenced this proceeding on December 16, 1985, and that Colorado refused to enjoin all post-compact ground water appropriations in Colorado during the pendency of the investigation. Colorado admits that the Colorado

representatives to the Arkansas River Compact Administration rejected requests by the Kansas representatives to investigate the consequences of possible future increases in the consumption of Colorado's "transmountain" return flows. Colorado denies the remaining allegations of paragraph 12 of the First Amended Complaint.

13. Colorado denies the allegations in paragraph 13 of the First Amended Complaint.

14. Colorado denies the allegations in paragraph 14 of the First Amended Complaint.

15. Colorado denies the allegations in paragraph 15 of the First Amended Complaint.

16. Colorado denies the allegations in paragraph 16 of the First Amended Complaint.

17. Colorado denies the allegations in paragraph 17 of the First Amended Complaint.

AFFIRMATIVE DEFENSES

1. Kansas failed to exhaust its administrative remedies under Article VIII of the Arkansas River Compact.

2. Kansas' claims against Colorado are barred by accord and satisfaction, failure to mitigate damages, laches, estoppel, waiver, statute of limitations, or the doctrine of unclean hands.

3. To the extent post-compact developments were beyond the control of the State of Colorado, Colorado is not liable for those acts.

4. Article V-E(5) of the Arkansas River Compact provides there shall be no allowance or accumulation of credits or debits for or against either state.

5. With regard to Kansas' claim that Colorado and its water users have materially depleted the usable and available stateline flows of the Arkansas River since the adoption of the Compact to the injury of

water users in Kansas under the Compact, Colorado asserts that irrigation in the Arkansas River basin in Colorado has declined since the adoption of the Compact and that acreage under irrigation in western Kansas has increased at least five-fold in the same period, from approximately 65,000 acres in 1948 to 350,000 acres in 1980. Kansas seeks to have this Court rewrite the Arkansas River Compact to impose a new stateline delivery obligation on Colorado so as to maintain a post-compact well economy in western Kansas, all at the expense of Colorado water users, contrary to the express terms of the Compact.

6. Waters brought into the Arkansas River basin from other river basins are not apportioned to Kansas under the Arkansas River Compact and Kansas has no claim or right to such waters.

7. In 1980, the Arkansas River Compact Administration approved an operating plan for John Martin Reservoir pursuant to which water stored in the conservation pool of the reservoir is transferred into separate storage accounts for Kansas and ditches in Colorado Water District 67 at agreed upon rates and is apportioned into the accounts in agreed upon percentages. Based upon a series of agreements among Colorado users, after water stored in the conservation pool is fully transferred to the separate storage accounts, but not necessarily released from the reservoir, Colorado reverts to administration of decreed priorities and the decreed rights of water users in Colorado Water District 67 are administered as against rights decreed to water users diverting upstream from John Martin Dam on the basis of relative priorities in the same manner as though John Martin Dam had not been constructed. The Colorado representatives approved the operating plan in 1980 and have allowed the operating plan to remain in effect from year-to-year thereafter, to the substantial benefit of Kansas water users, based upon the aforesaid agreements among Colorado water users to determine when a "call" by ditches in Colorado Water District 67 will be enforced above John Martin Reservoir. Those agreements were in turn based on an agreement to permit storage of historical direct-flow winter diversions upstream from John Martin Reservoir. Kansas has

accepted the benefits of the 1980 operating plan and agreed to its terms with knowledge of the agreements among Colorado water users and with knowledge that the 1980 operating plan would change the regimen of the Arkansas River. Therefore, by having accepted the benefits of the 1980 operating plan, Kansas is barred from asserting that any reregulation of the native waters of the Arkansas River be approved by the Compact Administration based upon the Administration's Resolution of July 24, 1951.

8. With regard to Kansas' allegation that Colorado, through its Compact "Commissioner", has rejected and continues to reject Kansas' requests to investigate Colorado's "unilateral rejection" of the Arkansas River Compact Administration's resolution of July 24, 1951, Colorado denies that the Resolution has any binding effect on Colorado. In the alternative, the Resolution was amended by the Administration on January 4, 1982. Further, Kansas failed to raise an objection to the winter storage program in Pueblo Reservoir for six years after it began operation in 1975 with the full knowledge of Kansas and the Administration.

COUNTERCLAIM

Defendant, the State of Colorado, by its Attorney General, asserts the following counterclaim against Plaintiff, the State of Kansas:

1. The Court has jurisdiction of this counterclaim under Article III, Section 2, Clause 2 of the Constitution of the United States, and Paragraph (a), Subsection (1), Section 1251, Title 28 of the United States Code.

2. The Arkansas River is an interstate stream which rises in the Rocky Mountains near Leadville, Colorado, then flows southeasterly to Salida, Colorado, then east through Canon City to Pueblo, Colorado, then across the plains of eastern Colorado into the State of Kansas.

3. In order to settle existing disputes and to remove causes of future controversy concerning the waters of the Arkansas River and

to equitably divide and apportion between the States of Colorado and Kansas the waters of the Arkansas River, as well as the benefits arising from the construction, operation, and maintenance of John Martin Reservoir for water conservation purposes, the States of Colorado and Kansas ratified the Arkansas River Compact, which Compact was approved by the United States Congress by Act of May 31, 1949, 63 Stat. 145.

4. Article V-E(2) of the Arkansas River Compact provides: "Water released upon concurrent or separate demands shall be applied promptly to beneficial use unless storage thereof downstream [from John Martin Reservoir] is authorized by the [Arkansas River Compact] Administration."

5. On information and belief, the state officials charged with administration of water rights in Kansas have allowed water released from John Martin Reservoir upon demand by Kansas under Article V of the Arkansas River Compact to be stored downstream in Lake McKinney in Kansas rather than being applied promptly to beneficial use, in violation of the provisions of Article V-E(2) of the Compact.

6. Subsequent to the approval of the Arkansas River Compact by the United States Congress in 1949, state officials charged with the administration of water rights in Kansas have allowed the construction of wells and have permitted ground water appropriations in Kansas that have materially depleted the usable quantity or availability for use to the surface water users in Kansas under the Compact. Those depletions caused Kansas to make additional demands for releases of water stored in John Martin Reservoir pursuant to the Compact to the detriment of water users in Colorado.

7. Irreparable injury to the State of Colorado and water users in Colorado under the Compact has been caused by the acts and conduct of the State of Kansas, its officers, and citizens in permitting the use of the waters of the Arkansas River in violation of the terms of the Compact.

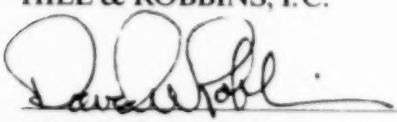
WHEREFORE, having fully answered and having asserted its affirmative defenses and counterclaim, Colorado prays that the Court grant judgment for Colorado and against Kansas on the claims of Kansas, that the Court issue its decree compelling the State of Kansas, its officers, and citizens to comply with the provisions of the Arkansas River Compact, that Colorado have and recover its reasonable costs, and for such other and further relief as the Court may deem proper under the circumstances.

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No. 105, ORIGINAL

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October Term, 1985

STATE OF KANSAS,

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v.

STATE OF COLORADO,

Defendant,

and

UNITED STATES OF AMERICA,

Defendant-Intervenor.

ARTHUR L. LITTLEWORTH, Special Master

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ABBREVIATIONS AND GLOSSARY

1.	Reporter's Transcript	RT Vol. at ___
2.	Exhibits of Parties, and Joint Exhibits	Kan. Exh. ___ Colo. Exh. ___ U.S. Exh. ___ Jt. Exh. ___
3.	Post-Trial Briefs	
	(a) Kansas' Post-Trial Opening Brief	Kan. Opening Br. at ___
	(b) Colorado's Closing Brief re Kansas' Well Claim	Colo. Closing Well Br. at ___
	(c) Colorado's Closing Brief re Kansas' Winter Water Storage Claim	Colo. Closing WWSP Br. at ___
	(d) Amended Trial Brief of the United States on Kansas' Winter Water Storage Program Claim	U.S. WWSP Br. at ___
	(e) Kansas' Post-Trial Answer Brief	Kan. Answer Br. at ___
	(f) Colorado's Response to Kansas' Post-Trial Opening Brief	Colo. Response Br. at ___

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(g)	Amended Response Brief of the United States on the Kansas Winter Water Storage Claim	U.S. Response Br. at ___
(h)	Kansas' Post-Trial Reply Brief.	Kan. Reply Br. at ___
(i)	Colorado's Reply Brief	Colo. Reply Br. at ___
(j)	Reply Brief of the United States on the Kansas Winter Water Storage Claim	U.S. Reply Br. at ___
(k)	Colorado's Memorandum re Matters to be Raised at Oral Argument	Colo. Oral Argument Memorandum at ___

4.	Acre-foot	AF, a volume of water one foot deep over one acre in area; equal to 325,900 gallons.
5.	Cubic feet per second	cfs, a rate of flow equal to 7.48 gallons per second, or 1.983 acre-feet per day.
6.	Evapotranspiration	ET, loss of water from soil by evaporation and by transpiration from plants growing thereon.

ABBREVIATIONS AND GLOSSARY – Continued

7.	Gallons per minute	gpm
8.	Hydraulic conductivity	The volumetric rate at which water will pass through a unit cross-sectional area of an aquifer under a given hydraulic gradient.
9.	Kilowatts (1,000 W)	kW
10.	Kilowatt hours	kWh
11.	Million acre-feet	MAF
12.	Potential evapotranspiration	PET
13.	Saturated zone	Portion of the geologic profile below the groundwater table, in which the pores or voids between the soil particles are filled with water.
14.	Specific yield	A measurement of the volume of water that will drain by gravity from a unit of saturated soil.

ABBREVIATIONS AND GLOSSARY – Continued

15.	Transmissivity	A quantitative measurement of the groundwater that will move through the full saturated thickness of the aquifer. Calculated as the hydraulic conductivity of the aquifer times the saturated thickness under a given hydraulic gradient.
16.	Unsaturated zone	Portion of the geologic profile above the groundwater table, or the saturated zone. The pores or voids between the soil particles may have both air and water in them.
17.	United States Geological Survey	USGS
18.	Winter Water Storage Program	WWSP

REPORT – PART I

PRIMARY REPORT ON LIABILITY ISSUES

SECTION I

INTRODUCTION

Like many rivers in the West, the upper reach of the Arkansas has been beset by decades of controversy. Twice before in this century, the States of Kansas and Colorado have litigated in the Supreme Court.[1] In the early years numerous suits were also filed among private water users in the two states.[2] Yet none of these legal actions successfully settled the basic issue of how the Arkansas River should be apportioned between the two states. Nor did the 1949 Arkansas River Compact achieve the lasting peace sought by those who negotiated that agreement, even though it was approved by the legislatures and governors of both states, as well as by the Congress of the United States.[3]

The settlement of Kansas, which was admitted to the Union in 1861, commenced before that in Colorado. It was not until 1876 that Colorado became a state. By the 1870s, the transformation of prairie grasslands in Kansas

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[1] *Kansas v. Colorado*, 206 U.S. 46, 51 L.Ed. 956, 27 S.Ct. 655 (1907); *Colorado v. Kansas*, 320 U.S. 383, 88 L.Ed. 116, 64 S.Ct. 176 (1943).

[2] See Kan. Exh. 129, Vol. I at 31-38, describing numerous actions within Kansas, and between Kansas and Colorado water users.

[3] Of the first seven members appointed to the body charged with administering the compact, five had served on the commission that negotiated the compact.

into irrigated farms and small towns was well underway. Kan. Exh. 129, Vol. I at 17. Kansas alleged in its first suit against Colorado that by 1883 practically all of the bottom lands of the Arkansas Valley in Kansas, were in a state of "successful and prosperous cultivation in reliance upon the waters of the Arkansas River" *Kansas v. Colorado*, 206 U.S. 46 at 51, 51 L.Ed. 956, 27 S.Ct. 655 (1907).

Prior to 1885, Colorado users took "comparatively little water" from the Arkansas River for irrigation purposes. *Id.* at 107-108. However, development in Colorado came rapidly with the construction of large irrigation canals and storage facilities. Kansas alleged that by 1901 Colorado users were diverting "all the natural and normal waters and a large portion of the flood waters" of the Arkansas River. *Id.* at 52.

The 1901 action was the first interstate water controversy heard by the Supreme Court. Initially, the Court's jurisdiction was challenged, but a demurrer on that basis was overruled. Moreover, the Court determined that Kansas could properly represent the interests of its citizens. *Kansas v. Colorado*, 185 U.S. 125, 46 L.Ed. 838, 22 S.Ct. 552 (1902).[4] Substantively, Kansas contended that nonriparian arid lands were being irrigated in Colorado, and that under English common law Kansas was entitled to receive the flows of the Arkansas River as they existed "before any human interference." *Kansas v. Colorado*, 206 U.S. 46 at 85, 98. Colorado, on the other hand, claimed the right of its users under Colorado appropriative doctrine

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[4] The jurisdictional issue was further considered in *Kansas v. Colorado*, 206 U.S. 46 at 80-85, 51 L.Ed. 956, 27 S.Ct. 655 (1907).

to take all of the streamflow, without regard to any downstream impact in Kansas. *Id.*

Not surprisingly, the Supreme Court rejected both of these extreme positions. Instead it ruled that the dispute should be adjusted ". . . upon the basis of equality of rights as to secure as far as possible to Colorado the benefits of irrigation without depriving Kansas of the like beneficial effects of a flowing stream." *Id.* at 100. This was the first expression of the doctrine of equitable apportionment of benefits in regard to interstate streams.

Reviewing the evidence in this early case, the Court found that the diminution of flow caused by Colorado irrigation had worked some detriment to Kansas, but comparing that detriment to the benefits in Colorado, the Court concluded ". . . it would seem that equality of right and equity between the two states forbids any interference with the present withdrawal of water in Colorado for purposes of irrigation." *Id.* at 114. The Court cautioned, however, that "it is obvious that if the depletion of the waters of the river by Colorado continues to increase there will come a time when Kansas may justly say that there is no longer an equitable division of benefits, and may rightfully call for relief against the action of Colorado, its corporations and citizens, in appropriating the waters of the Arkansas for irrigation purposes." *Id.* at 117.

It was Colorado however, not Kansas, that next brought the ongoing dispute back to the Supreme Court. In 1928 Colorado filed a bill in equity seeking to protect the rights established by the earlier decree, and to enjoin further prosecution of suits between water users in the

two states. That action was not decided by the Supreme Court until 1943. *Colorado v. Kansas*, 320 U.S. 383, 88 L.Ed. 116, 64 S.Ct. 176 (1943). A Master appointed to take evidence found that indeed there had been a material increase in river depletions caused by use in Colorado since the first Supreme Court decision. 320 U.S. at 391. Accordingly, he recommended a specific apportionment of the dependable flows of the river, namely, five-sixths to Colorado and one-sixth to Kansas. *Id.* at 390.

Once again, however, Kansas was turned away. The Supreme Court rejected the Master's finding that Colorado's use had materially increased,[5] as well as his recommendation for a specific allocation of flows. The only relief granted was to enjoin the private litigation. The Court explained its cautious approach in these words:

> "The reason for judicial caution in adjudicating the relative rights of states in such cases is that, while we have jurisdiction in such disputes, they involve the interests of quasi-sovereigns, present complicated and delicate questions, and,

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[5] George S. Knapp, Chief Engineer of the Kansas Division of Water Resources, complained that the Supreme Court was mistaken in its conclusion that Colorado diversions had not changed since 1907. Knapp thought the Court had relied on a table in the Colorado brief showing a decrease in diversions between 1912-15 and 1931-40 from 1,145,000 acre-feet annually to 877,000. However, he claimed that the records of Colorado's own state engineer demonstrated an increase. See Kan. Exh. 129, Vol. I at 166-67. By way of comparison, Colorado in the present case computed average diversions for 1950-85 at 884,881 acre-feet annually, with some high years exceeding 1,400,000 acre-feet. Colo. Exhs. 838, 839. These surface diversion figures do not include pumping, although they do include transmountain imports.

> due to the possibility of future change of conditions, necessitate expert administration rather than judicial imposition of a hard and fast rule. Such controversies may appropriately be composed by negotiation and agreement, pursuant to the compact clause of the Federal constitution. *We say of this case, as the court has said of interstate differences of like nature, that such mutual accommodation and agreement should, if possible, be the medium of settlement, instead of invocation of our adjudicatory power." Id.* at 392, emphasis added.

Against the background of this second Supreme Court decision, and the urgent need to develop operating principles for the storage of water in the newly constructed John Martin Reservoir,[6] the states renewed their efforts to negotiate an interstate compact.[7] After some

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[6] Construction of John Martin Reservoir began in 1939 and was sufficiently completed to permit limited storage in 1942. Jt. Exh. 129 at 47. Gen. Kramer reported that the reservoir had an original storage capacity of approximately 700,000 acre-feet. It is located on the mainstream about 58 miles upstream from the Colorado-Kansas border. The upper 280,000 acre-feet of storage capacity was initially allocated to flood control, with the remaining 420,000 acre-feet assigned to water conservation. Jt. Exh. 15 at 33.

[7] In 1921 and 1923 the legislatures in both states had authorized the appointment of commissioners to negotiate an interstate compact. Colorado named Delph E. Carpenter, a highly respected Colorado lawyer who had initiated the compact effort. Kansas selected George S. Knapp, then its Irrigation Commissioner. These two men drafted a tentative Arkansas River Compact which was submitted in 1925 to irrigation interests in both states for their comments. However, opposition developed and the proposed compact was never ratified. Kan. Exh. 129, Vol. I at 39-45.

three years of formal negotiations, the Arkansas River Compact was finally completed and approved in 1949. Pursuant to Article IX-A the compact became effective upon ratification by each state legislature and consent by Congress. 1949 Colo. Sess. Laws 485, § 1, codified at C.R.S. § 37-69-101 (1973); 1949 Kan. Sess. Laws 829, codified at Kan. Stat. Ann. § 82a-520; Act of Congress of May 31, 1949, 63 Stat 145. A copy of the compact is included as Exhibit 1 in the Appendix.

The compact recites that its major purposes are to settle existing disputes, to remove causes of future controversy, and to "Equitably divide and apportion" the waters of the Arkansas River, "as well as the benefits arising from the construction . . . of John Martin Reservoir." Articles I-A, I-B. The compact does not allocate to Kansas either a defined quantity of Arkansas River water, or a specific share of the river flow.[8]

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[8] The lack of a specific allocation was not an issue before Congress. Support there for the compact was universal and enthusiastic. Gen. Hans Kramer, the United States representative on the Compact Negotiating Commission, and its chairman, reported that both states had sought ". . . to attain a definitive solution to their perennial problem of apportionment of the waters of the Arkansas River." Jt. Exh. 15 at 33. He was of the firm conclusion that the compact provided a "fair, constructive, and workable solution" to the controversy. *Id.* at 36. He went on to pay tribute to the compact commissioners:

> "It has been an unusual experience to participate in these negotiations. To my knowledge they have been of a different character from most interstate compacts in that they have been preceded by this long history of litigation, so that the compact commissioners, you might say, came into the arena wearing gloves, ready to continue slugging. But fortunately, as has been

With respect to this case, one of the key provisions of the compact is found in Article IV-D. It states that the compact is not intended to prevent future development of the Arkansas River Basin in Colorado by either federal or state agencies, or by private enterprise, which may involve the construction of dams, reservoirs and other works, ". . . Provided, that the waters of the Arkansas River . . . shall not be materially depleted in usable quantity or availability for use to the water users in Colorado and Kansas under this Compact by such future development or construction."

Administration of the compact is vested in the Arkansas River Compact Administration, which consists of three representatives from each state, appointed by their respective governors. Articles VIII-A, VIII-C. A representative of the United States is an ex-officio member, who acts as chairman but has no vote. Article VIII-C. The compact administration can act only with full agreement. It provides that each state shall have but one vote, and every action of the Administration "shall require unanimous vote." Article VIII-D. The requirement for continued agreement between the two states appears not to

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testified to here by the representatives of both States, that attitude did not continue very long and we were fortunate in clearing the atmosphere of all the prejudice and awkwardness that goes with a long history of litigation.

"The commissioners approached this matter in a fair-minded way. They were men of good will, good intent, and of good faith. I think their work is a monument to that approach and to that philosophy. It is, to my mind, a fine example of the way interstate arguments ought to be settled." *Id.* at 37.

have been a problem in the early years. But changing conditions along the river gradually began to erode the early promise of the compact.

In the years following approval of the compact, farmers in Colorado constructed a large number of new wells along the Arkansas River.[9] These wells were used generally to supplement surface diversions delivered through the various canal companies. RT Vol. 66 at 32-34; Jt. Exh. 157 at 10. Through the use of wells, farmers could better time the availability of their water supplies and grow higher value crops. RT Vol. 66 at 32-33, 46. No one questions the fact that these wells depleted river flows, perhaps more slowly than the canal companies' surface diversions, but with the same inevitability. Jt. Exh. 157 at 11; Jt. Exh. 78; RT Vol. 76 at 56; RT Vol. 30 at 59; *Kuiper v. Atchison, Topeka & Santa Fe Ry. Co.*, 195 Colo. 557, 581 P.2d 293 at 294-95 (1978).

During the period when most of the new wells were constructed,[10] Colorado required either no prior state

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[9] In a 1968 study, the United States Geological Survey ("USGS") reported there were 1,348 "large-capacity" irrigation wells located in the valley fill aquifer along the river in Colorado. Jt. Exh. 66 at 2. Groundwater in this aquifer is in hydraulic continuity with the mainstem of the river, and the surface flows and groundwater constitute a common supply. Pumping increased, according to this study, from 31,000 to 185,000 acre-feet annually in the period 1950 to 1965. *Id.* at 5. Another USGS report puts the 1964 well production at 230,000 acre-feet. Jt. Exh. 74 at 20.

[10] Of the 1,348 large irrigation wells found in 1968, the USGS reported that about 1,000 had been constructed between 1950 and 1965. Jt. Exh. 66 at 1. It was not until 1965 that

approval at all or, after 1957, only a ministerial permit. Subsequent efforts by the legislature and the Colorado state engineer's office to control well production and to bring these wells under the state's statutory appropriation system ran into strenuous opposition. The success of the various attempts at control were limited at best.

In the 1970s the United States also completed construction of two more large dams and reservoirs in Colorado. Pueblo Reservoir, finished in 1975, is located on the mainstem of the Arkansas shortly after it emerges from the Rocky Mountains. Trinidad Reservoir is situated on the Purgatoire River, the main tributary of the Arkansas in Colorado, and was completed in 1976. Storage in each of these reservoirs has become an issue in this case.

By the early 1980s, Kansas began its own investigation of possible compact violations arising from the impact of postcompact wells and the operation of the two federal reservoirs (Pueblo and Trinidad) on the river flows reaching Kansas. Colorado concedes that during the 1970s postcompact pumping caused a decline in Stateline flows,[11] although on several grounds Colorado

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Colorado first attempted to regulate groundwater production, and that initial effort was struck down by the Colorado Supreme Court. *Fellhauer v. People*, 167 Colo. 320, 447 P.2d 986 (1968). Colorado acknowledges that most of the postcompact wells were drilled in the 1950s and early 1960s. Colo. Closing Well Br. at 13. See also Colo. Exh. 165*, Table A.1.

[11] Colo. Opening Statement, RT Vol. 59 at 16; Colo. Closing Well Br. at 11, 19. The spelling of "Stateline," capitalized and used sometimes as a noun and at other times as an adjective, fits none of the traditional rules. However, this spelling and use appears in the compact itself and has been consistently adopted by the parties, so it is used here.

disputes the right of Kansas to a larger share of river flows. RT Vol. 81 at 155-56; RT Vol. 84 at 42; RT Vol. 115 at 62; RT Vol. 66 at 128-29, 132. After making a formal complaint to the Arkansas River Compact Administration, Kansas came to believe that the unanimous vote requirement of the compact would continue to thwart any administrative relief. Kansas thus turned back to the Supreme Court, filing this action in December 1985.

SECTION II

STRUCTURE OF THE REPORT AND RECORD

This Report embraces my findings and recommendations following completion of the liability phase of the trial. The remedy issues, including damages, were severed pending a final determination on liability. The Report is comprised of five parts. Part I is the primary post-trial Report. Parts II, III, IV and V represent substantive decisions made earlier during the course of trial but which, with the approval of the parties, have been held for Supreme Court review until now. Part II is my decision, subject to confirmation of the Court, to grant Colorado's motion for partial summary judgment on the legal issue of whether the Winter Water Storage Program in Pueblo Reservoir was subject to the approval of the Arkansas River Compact Administration. Part III is my decision, subject to confirmation of the Court, to dismiss the Kansas claim arising from the operation of Trinidad Reservoir. Parts IV and V include my decisions, subject to confirmation of the Court, to dismiss the two Colorado counterclaims.

A separate Appendix is also provided. The Appendix includes certain other decisions and orders, important to the conduct and outcome of the trial, but not in and of themselves determinative of final substantive issues. These include my denial of Colorado's motion to stay and to return certain issues to the Arkansas River Compact Administration for failure to exhaust administrative remedies (Exhibit 5); my order granting Kansas' motion to bifurcate the trial into liability and remedy phases (Exhibit 6); my order governing discovery procedures for

expert witnesses and certain other pre-trial matters and the amendment thereto (Exhibit 7); my order concerning the conduct of the trial following the disability of Kansas' chief technical expert (Exhibit 8); and my order on the admissibility of Dr. Dracup's notes (Exhibit 9). Numerous other orders were issued on various discovery and evidentiary issues. These are not included in the Appendix, but may be found in the record if the parties should take exception to any of them.

The Appendix also includes copies of the amended pleadings on which the case was tried (Exhibits 2, 3, and 4), as well as certain key exhibits. Other items in the Appendix are noted as they appear in the text.

The record (apart from exhibits and the reporter's transcript) has been maintained in two separate files. The first consists of 26 volumes, and includes all pleadings, motions, briefs, decisions, orders and discovery documents. A comprehensive index and an index within each volume have been prepared for these documents. The second file is comprised of 12 volumes and includes all of the correspondence with and among the parties, and occasionally others. All documents in both files have been date-stamped and filed chronologically.

The reporter's transcript consists of 143 volumes through oral argument on my Draft Report, with a separate volume for each day of trial. Initially the transcripts were numbered with Roman numerals only. But this system became increasingly cumbersome as the trial lengthened. Arabic numerals were then substituted, and these have been used in the citations to the record. The reporter's transcript is cited in this Report as "RT Vol. 88 at

105." Each volume of the transcript includes an index identifying the witnesses who testified, and any exhibits admitted into evidence, including appropriate page references. Certain corrections to individual transcripts were made pursuant to stipulations of the parties and by my orders dated January 5, 1994 and March 11, 1994. These are included in Appendix Exhibits 12 and 13, respectively, and a copy of the pertinent order is included in each affected transcript.

Exhibits have been divided into four groups: those submitted by Kansas, by Colorado, by the United States, and the joint exhibits. Each exhibit is contained in a separate folder, except for certain "unique" exhibits such as large mounted maps. The exhibit folders occupy 29 boxes, which have been labeled to show the particular exhibits inside each box. Throughout the trial a number of exhibits were revised, and these are identified with an asterisk following the exhibit number. In some cases more than one revision has occurred and these exhibits will carry more than one asterisk. For example, Kan. Exh. 111*** has undergone a minimum of three revisions.[12] Where revisions have been made, the exhibit folder contains the original form of the exhibit and all of the revisions admitted into evidence. Revisions not admitted, and all exhibits not offered or rejected, are included in a single box and so identified. Some exhibits were lodged with me before trial but were not offered into evidence. These have been retained with my bench copies, and have not been included in the 29 boxes of exhibits.

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[12] Some early revised exhibits were also identified with a date, e.g., Kan. Exh. 111* (12/6/90).

A complete Record of Exhibits has also been prepared. This identifies each exhibit by number, the offering party (or joint exhibit), the date when it was first identified in the trial, the witness or witnesses testifying to the exhibit, and the date of its admission into evidence. Since the reporter's transcripts are all dated, one can easily locate the testimony concerning any particular exhibit.

A final joint exhibit list has also been filed by counsel, a copy of which is included in the first box of joint exhibits. Not all of the joint exhibits on this final list, however, were offered into evidence.

SECTION III

PROCEDURAL HISTORY

A. Pleadings.

Kansas filed its motion for leave to file a complaint, the complaint itself, and a brief in support of the motion on December 16, 1985. The State of Colorado was named as the sole defendant. The complaint alleged that the Arkansas River is an interstate stream and the subject of a 1949 compact, made between the States of Kansas and Colorado and approved by the United States Congress. Kansas charged that the State of Colorado and its water users had materially depleted the usable and available Stateline flows of the Arkansas River in violation of the compact. Specifically, Kansas alleged that Stateline depletions were caused by postcompact wells in Colorado which annually pumped approximately 150,000 acre-feet of groundwater related to flows in the Arkansas River.

Kansas also alleged that Colorado had blocked an administrative investigation by the Arkansas River Compact Administration into Colorado's compact violations. The compact provides that all actions of the compact administration must be by unanimous vote, each state having one vote. The compact administration is chaired by the United States representative, but the United States has no vote. According to the Kansas complaint, the alleged violations which Kansas put before the compact administration included: the impact of postcompact wells; the operation of Trinidad Reservoir located on the Purgatoire River, a main tributary of the Arkansas River; the consequences of future increases in the consumption

of return flows from water imported by Colorado into the Arkansas River Watershed; and Colorado's rejection of a 1951 resolution of the Arkansas River Compact Administration allegedly requiring that any storage of the native waters of the Arkansas River be approved by the compact administration. This last issue related to Pueblo Reservoir located on the mainstem of the Arkansas, and the operation of the so-called Winter Water Storage Program in that reservoir.

The prayer of the original complaint sought a decree commanding Colorado, its officers, citizens and political subdivisions to deliver the waters of the Arkansas River in accordance with the provisions of the compact.

Colorado responded on February 18, 1986 by filing a brief in opposition to the Kansas motion. Essentially, Colorado argued that Kansas had failed to demonstrate that an investigation by the Arkansas River Compact Administration would not be an adequate means of vindicating the allegations of compact violations. Colorado claimed there was substantial disagreement over the issue of postcompact well development in Colorado, and whether such development had materially depleted Stateline flows in violation of the compact. Premature invocation of the Supreme Court's jurisdiction, argued Colorado, would deny the Court the benefit of the special expertise and abilities of the compact administration in addressing these complex hydrologic issues. Moreover, Colorado asserted that the compact administration was not "deadlocked or unable to act," but had been proceeding in a cooperative manner to conduct the necessary investigation. Colo. Brief in Opposition at 8.

Before the Supreme Court ruled, however, Kansas filed a new motion, for leave either to file its original complaint, ". . . or, in the alternative, that the court order the State of Colorado to comply with Article VIII(H) of the Arkansas River Compact . . . to promptly investigate all of Kansas' allegations of Compact violation." Kan. Motion for Leave to File Complaint, Mar. 3, 1986, p. 8. Briefs were then filed by both states on the original Kansas motion for leave to file its complaint, or in the alternative, to compel an administrative investigation by the Arkansas River Compact Administration. The Kansas brief outlined in further detail the efforts made within the compact administration, and the alleged frustration of the administrative procedure.

On March 24, 1986, without further argument, the Court issued the following order:

> "The motion for leave to file a bill of complaint is granted. Defendant is allowed sixty days within which to file an answer." 475 U.S. 1079, 89 L.Ed.2d 712, 106 S.Ct. 1454 (1986).

On May 22, 1986 Colorado filed its answer and counterclaim to the Kansas complaint. Colorado denied the allegations of compact violations, and asserted several affirmative defenses. Colorado again alleged that Kansas had failed to exhaust its administrative remedies under the compact, and that its claims were barred by laches and other equitable doctrines. It also alleged that irrigated acreage in Colorado had declined since adoption of the compact, while irrigation in Kansas had increased. Colorado charged that Kansas was seeking to have the Court rewrite the Stateline delivery obligations of the

compact so as to maintain this postcompact Kansas economy. Colorado further alleged that transmountain imports from the western slope of the Rocky Mountains were not subject to the compact nor any claim of Kansas. Finally, Colorado alleged that the Winter Water Storage Program in Pueblo Reservoir was not subject to approval by the compact administration, and that Kansas was barred from asserting such claim by virtue of a 1980 Operating Plan adopted by the compact administration and the benefits received by Kansas under this plan.

Colorado also asserted two counterclaims: (1) that Kansas had stored water released from John Martin Reservoir in violation of the compact; and (2) that wells in Kansas had depleted the supply of surface water available to Kansas users, and had thus caused Kansas to make additional demands for releases of water stored in John Martin Reservoir in Colorado, to the detriment of Colorado users. Kansas' reply to Colorado's counterclaim was filed on June 11, 1986.

On February 24, 1989, with leave of the Supreme Court, Kansas filed a motion to supplement the allegations in its original complaint. In addition to charging compact violations of Articles IV-D and V-F, Kansas sought to add violations of Articles V-E(3), V-E(4) and V-H(2). Colorado opposed the amendment. The United States, which by then had intervened, took no position since no federal interests were involved.

On May 19, 1989, Kansas filed a second motion to amend its complaint by adding claims for both general and special damages. This motion was based upon the Supreme Court decision in *Texas v. New Mexico*, 482 U.S.

124, 96 L.Ed.2d 105, 107 S.Ct. 2279 (1987), in which for the first time damages were allowed as a remedy for breach of an interstate compact. Colorado did not oppose the amendment for general damages based upon the alleged depletion of Kansas' share of the Arkansas River. However, Colorado did object to the claim for special damages resulting from depletion of groundwater in the Ogallala Aquifer, essentially a nonrenewable source, if this claim were based upon facts not originally alleged. In its reply, Kansas acknowledged that the claim for special damages did in fact stem from allegations already made. Again, the United States took no position on this second motion to amend. By order of October 12, 1989, I allowed both Kansas amendments. Colorado and the United States thereupon filed answers to the Kansas First Amended Complaint.

The case was tried on the basis of these amended pleadings, copies of which are included in the Appendix as Exhibit 2 (Kansas First Amended Complaint); Exhibit 3 (Colorado Answer to First Amended Complaint and Counterclaim); and Exhibit 4 (Answer of the United States to the First Amended Complaint).

B. Special Master.

On July 7, 1986, the Court appointed the Hon. Wade H. McCree, Jr. as the Special Master in this case. 478 U.S. 1018, 92 L.Ed.2d 736, 106 S.Ct. 3330 (1986). Judge McCree conducted an initial pretrial conference on August 20, 1986. At that time, the parties agreed that discovery would be conducted under Rules 26-37 of the Federal Rules of Civil Procedure, or by stipulation. The states also

agreed upon certain other arrangements for the production and copying of documents and records. A written stipulation including the various agreements was mailed to Judge McCree on December 17, 1986, but he died before giving his approval. Nonetheless, the parties have continued to honor the stipulation, and the case has generally been tried according to the Federal Rules of Civil Procedure. (See Supreme Court Rules for original jurisdiction, Rule 17.)

I was appointed to replace Judge McCree as Special Master on October 19, 1987.[13]

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[13] The Court's order referring this matter to me states:

"It is ordered that Arthur L. Littleworth, Esquire, of Riverside, California, be appointed Special Master in place of the Honorable Wade H. McCree, Jr., deceased.

"The Special Master shall have authority to fix the time and conditions for the filing of additional pleadings and to direct subsequent proceedings, and authority to summon witnesses, issue subpoenas, and take such evidence as may be introduced and such as he may deem it necessary to call for. The Special Master is directed to submit such reports as he may deem appropriate.

"The compensation of the Special Master, the allowances to him, the compensation paid to his legal, technical, stenographic and clerical assistants, the cost of printing his report, and all other proper expenses, including travel expenses, shall be charged against and be borne by the parties in such proportion as the Court may hereafter direct."

C. Initial Proceedings.

My first status conference was held on February 26, 1988 in a hotel near the Los Angeles airport. In addition to representatives of the two states, counsel for the United States also attended. The United States indicated that it was then in the process of deciding whether or not to intervene. Three federally owned dams and reservoirs have been constructed within the Arkansas River system in Colorado. These are John Martin Reservoir, Pueblo Reservoir and Trinidad Reservoir. Operations of the latter two are at issue in this case. Neither of the states objected to the participation of the United States as an intervenor.

(1) Place of Trial.

At this first meeting the place of trial was discussed. Counsel for both states indicated a preference for a neutral location outside of both states. The Los Angeles area appeared to be the best choice, and ultimately I arranged for courtroom space in the United States Court of Appeals, Ninth Judicial Circuit, Federal Building, 125 South Grand Avenue, Pasadena, California. The trial was held at that location.

(2) Exhaustion of Administrative Remedies.

At this initial status conference, Colorado indicated that it was again going to raise the issue of Kansas' exhaustion of administrative remedies as to two claims in the complaint. These related to the operation of Trinidad Reservoir on the Purgatoire River, and the postcompact

wells in Colorado. It was agreed that the exhaustion issue should be decided on motion, and on March 14, 1988, I issued an order requiring Colorado to file its motion within sixty days, and setting forth a briefing schedule for responsive and reply briefs. Oral argument was also held, in the Federal Court of Appeals in Pasadena on September 28, 1988. As part of its motion to stay, Colorado filed four large volumes of appendix documents, which dated back a number of years and which appeared to include all of the pertinent compact administration record with respect to postcompact well development and Trinidad Reservoir.

My decision on this motion was issued October 21, 1988. I denied the Colorado motion to return these issues to the compact administration, finding that such action would not be effective and that further delay would not be fair. The structure of the compact administration is such that even a preliminary investigation of the Kansas allegations had not proceeded. By exercising its veto on the commission, even though done in good faith, Colorado effectively prevented "authoritative Commission action." See *Texas v. New Mexico*, 462 U.S. 554, 568, 77 L.Ed. 2d 1, 103 S.Ct. 2558 (1983). A copy of my decision is included as Exhibit 5 in the Appendix.

(3) Site View.

It was also agreed at the first status conference that a site view of the Arkansas River Basin would be helpful. Accordingly, a tour was held on September 13 and 14, 1988, with representatives of both states and of the United States present. The itinerary covered both a land

and air inspection of the Arkansas River Basin from Pueblo, Colorado to Garden City, Kansas, including the Purgatoire River drainage area and Trinidad Reservoir.

(4) Partial Summary Judgment on 1951 Compact Administration Resolution.

Finally, at the Los Angeles status conference, it was agreed that the Kansas claim on the 1951 Compact Administration Resolution could be bifurcated and decided as a matter of law. In its complaint, Kansas alleged that any reregulation of the native waters of the Arkansas River requires the approval of the compact administration, based upon a resolution adopted by the administration on July 24, 1951. Specifically, this claim applies to the Winter Water Storage Program in Pueblo Reservoir. On November 28, 1988, Colorado filed a Motion for Partial Summary Judgment on this issue. Extensive briefs were filed by both states, together with several volumes of documentary evidence, some going back to events leading up to the adoption of the Arkansas River Compact in 1949.

My decision on the Colorado motion was issued September 15, 1989; I recommended that the motion for partial summary judgment be granted. This motion dealt with a discrete legal issue, namely, whether the compact administration had the authority to approve or disapprove the Winter Water Storage Program in Pueblo Reservoir. As part of these general proceedings, Colorado also moved that the question of any actual impact on Kansas of the Winter Water Storage Program be referred back to the compact administration. Again, the grounds were

based upon the alleged failure by Kansas to exhaust its administrative remedies. I denied that motion, and therefore the factual issue of whether the operation of the Winter Storage Program has materially depleted the waters of the Arkansas River in violation of the compact comprised one of the major issues at trial. A copy of my decision on these winter storage motions is included in this Report as Part II.

(5) Intervention by the United States.

The United States, on January 31, 1989, filed a Motion for Leave to Intervene as a Party Defendant. The motion was accompanied by a Stipulation for Intervention signed by counsel for both states. My order, dated February 9, 1989, granted the motion, allowing the intervention of the United States to represent the federal interests raised by the Kansas complaint and the answer and counterclaim filed by Colorado.

(6) Severance of Damage and Remedy Proceedings.

As part of the Kansas motion to amend its complaint to add claims for damages, Kansas also moved to sever all proceedings relating to damages, and to reserve those issues for subsequent proceedings following a final decision on liability. Initially, Colorado had strenuous objections to the motion, while the United States took no position. Following briefing and argument, however, Colorado focused its opposition on specific matters, and I attempted to recognize those concerns in my order. On

January 2, 1990 I granted the Kansas motion to bifurcate the trial into liability and remedy phases, provided that Colorado would not be limited during the liability phase from introducing such economic or other evidence related to damages as might be necessary to its defense on the issue of liability, or in support of its affirmative defenses or counterclaims. A copy of this order is included as Exhibit 6 in the Appendix.

(7) Allocation of Fees and Costs.

Pursuant to the agreement of the parties, and by order dated October 9, 1989, fees and costs in this case were allocated as follows: 40% to the State of Kansas, 40% to the State of Colorado, and 20% to the United States. The United States' share has been calculated from the time that it intervened, February 9, 1989.

D. Discovery, Expert Witnesses and Motions.

The parties began serious discovery in the fall of 1988. Discovery was extensive and became increasingly contentious. Numerous motions to compel production of documents and answers to interrogatories were filed. There were motions to quash subpoenas and motions to enforce compliance with subpoenas. Privileges were invoked and an *in camera* inspection was required. Protective orders and sanctions were sought. Motions *in limine* to exclude certain witnesses and areas of testimony were filed. No useful purpose would be served by reviewing these proceedings in detail. They occupy many volumes

in the records of this case, and can be specifically identified from the index. Perhaps it is sufficient here to report that I believe that all appropriate information was ultimately made available to the parties. Nor did any party acquire information that should have been protected. Finally, none of the discovery disputes seem to have carried over into the trial, or to have adversely impacted the full presentation of the parties' respective cases.

On September 22, 1989 I ordered that the parties designate their expert witnesses and the subject matter of their testimony by January 15, 1990. Kansas identified 24 experts, Colorado 41, and the United States 2. Not all of those originally identified actually testified, and under later procedures, some additional experts appeared who were not at first named. While some nonexperts also testified, the trial was dominated by expert witnesses.

Following a pretrial conference and argument on February 16, 1990, an additional order governing the discovery procedures for expert witnesses and certain other pretrial matters was issued. A copy of that order, dated March 7, 1990, together with the amendment thereto, is included as Exhibit 7 in the Appendix. The order required that all parties provide statements of the substance of the facts and opinions to which their expert witnesses were expected to testify, and a summary of the grounds for each opinion stated, as required by Rule 26(b)(4)(A)(i). A period of two months was allowed for the depositions of the Kansas experts, and an equal period for the depositions of the Colorado and United States experts. Copies of all exhibits were required to be exchanged by August 15, 1990. The authenticity of all documents designated as exhibits was deemed to be

admitted unless written objections were filed by August 29, 1990. All pretrial motions were required to be filed no later than August 15, 1990.

Certain substantive motions were disposed of before trial. For example, Colorado sought a ruling of law on the meaning of Article V-E(5) of the compact. This motion was denied, and the issue deferred to the trial. Kansas sought to have Colorado's affirmative defenses stricken. This motion, too, was denied.

The trial date was then set for September 17, 1990, and trial did commence on that date.

E. Pretrial Filings.

The pretrial order of March 7, 1990, required the parties to file statements of entitlement, in addition to pretrial statements. These statements taken together provide detailed views of the entitlements claimed by each state to receive or use the waters of the Arkansas River under the Arkansas River Compact. Moreover, they include considerable documentary evidence intended to support their positions.

Many of the hydrologic data and the facts concerning water use in Colorado and Kansas are in substantial dispute in this case. Similarly, the parties hold disparate views on the intent and meaning of the Arkansas River Compact. For these reasons, an agreed statement of facts was not possible. However, the parties did agree upon 169 joint exhibits which were lodged prior to trial. This number was supplemented by four additional joint exhibits filed shortly after trial began.

F. Trial.

The liability phase of the trial commenced on September 17, 1990. That portion of the trial was completed on December 16, 1992. During this period of time, there were 141 actual trial days. The reporter's transcript includes 19,735 pages through completion of the evidence, and the number of exhibits admitted and lodged exceeds 2,000.

The Kansas case was presented during the fall of 1990 and appeared to be largely completed by the end of January, 1991. At that time, the Kansas expert on the stand was Timothy J. Durbin. He was Kansas' chief technical expert and had begun his work on this case in 1985. After testifying for approximately one month, under direct and cross-examination, Mr. Durbin suffered a breakdown and was admitted to a psychiatric hospital. In the latter part of his cross-examination, it began to appear that a number of errors had been made in various Kansas exhibits, including at least one significant mistake in the coding instructions to the Kansas hydrologic-institutional model. Kansas began to file overnight revisions, sometimes more than once, to certain key conclusionary exhibits. This computer model was crucial to the Kansas case. It was used to estimate depletions in Stateline flows from 1950 to 1985 caused by postcompact wells and the Winter Water Storage Program in Colorado.

The trial was recessed while I attempted to find out more about Durbin's condition and when he would be able to return. A medical report was obtained from his attending physician, and Colorado requested that I obtain a second opinion which it paid for. I kept the details of

these medical reports confidential, although their general conclusions were made known to the parties. From my conversations with the two psychiatrists, and my review of their reports, I concluded that to protect Mr. Durbin's future well-being, and ultimately the proper presentation of the Kansas case, he should not be pressured into returning. It was clear that he would not have been able to resume his trial responsibilities soon, if at all.

Meanwhile, Kansas filed a formal motion to continue the trial for seven months in order to obtain and prepare replacement experts. Colorado objected to such a lengthy continuance for reasons which are discussed in detail in my March 27, 1991 order on the Kansas motion. A copy of that order is included as Exhibit 8 in the Appendix. The Kansas motion, of course, would also have delayed Colorado, which was then fully prepared and ready to proceed with its case. While I ruled that completion of the Kansas case on direct, and any rebuttal evidence, should be continued until either Mr. Durbin was able to resume or replacement experts were prepared, I did not believe that it was necessary or desirable to stop the trial entirely. Accordingly, Colorado was ordered to begin the presentation of its case, reserving Kansas' right to cross-examine on Colorado's modeling testimony when Kansas had expert assistance available. Under this modified trial procedure, Colorado completed its case in chief on May 30, 1991, subject to its right to respond to the completed Kansas case. RT Vol. 87 at 153, 156.

Because of other trial conflicts affecting various counsel and experts, the trial could not be resumed until February 24, 1992. At that time, Kansas began the presentation of what it called its "replacement case." Its new

chief expert was Steven P. Larson, who was assisted by several Kansas experts who had testified earlier but who now assumed expanded roles. Kansas referred to this group as its "replacement experts."

This team had made a number of corrections and modifications to the Kansas hydrologic-institutional model. Many of these changes had been recommended by the Colorado experts. Kansas lodged 63 modified exhibits, changing previously admitted evidence, and also lodged 10 new exhibits. As a result of this new work, the replacement experts testified that the Stateline depletion figures claimed earlier by Kansas were not reliable. They offered new opinions, substantially reducing the amount of the Kansas claim. For example, the exhibits presented through Mr. Durbin showed that postcompact wells in Colorado over the period of 1950-85 had caused depletions in the Arkansas River flows into Kansas totaling approximately 1,581,000 acre-feet. Kansas Exh. 111*. Larson reduced this amount to 852,000 acre-feet. Kansas Exh. 111***.[14] Kansas completed its replacement case and rested on March 18, 1992. RT Vol. 100 at 80-81.

Because of the modifications made to the normal order of trial, additional depositions were required from time to time, and many new exhibits not initially listed

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[14] These figures are in terms of depletions to total flows, not to usable flows. Ultimately, the compact requires that usable flows be addressed, but for illustrative purposes here the comparison between Durbin and Larson is more easily made using total flow figures. Also, these figures do not reflect any offset for return flows from transmountain imports. Kansas acknowledges that this adjustment is also necessary.

were required. However, all computer disks and backup data were required to be exchanged before court testimony. This was accomplished cooperatively, and generally without formal court orders.

Colorado then responded to the Kansas replacement case and completed its own case in chief. This segment of the trial began on April 27, 1992 and lasted through May 27, 1992. RT Vol. 117 at 160.

Presentation of the United States evidence followed immediately after Colorado. Since I had indicated that the Kansas claim arising from operations of Trinidad Reservoir (a federal facility) would be dismissed, the United States evidence centered upon the Winter Water Storage Program ("WWSP") in the Pueblo Reservoir. This program began in 1976 upon completion of Pueblo Reservoir and continued thereafter except for the year 1978. Under the program, Arkansas River flows were stored in the winter for later summer irrigation. Previously, the winter flows had been in part diverted to irrigate bare fields, and thereby increase soil moisture for the next growing season. The issue is whether or not storage and later summer use of this water depleted river flows at the Stateline. The United States completed its presentation on June 19, 1992. RT Vol. 124 at 102.

Kansas' rebuttal testimony and surrebuttal by Colorado and the United States commenced on September 21, 1992 and were completed on November 24, 1992. The evidentiary presentations of all parties were completed December 16, 1992. RT Vol. 141 at 107.

By agreement of the parties, opening briefs were submitted simultaneously on March 15, 1993, answering

briefs on May 3, 1993, and final reply briefs on May 17, 1993. Additional responses to specific written questions from me were filed August 24, 1993 and September 3, 1993.

My Draft Report was completed and circulated to the parties on February 4, 1994. Oral Argument on the draft was held on April 14 and 15, 1994.

G. Dismissal of Trinidad Reservoir Claim.

At the conclusion of Kansas' presentation of evidence on the operation of Trinidad Reservoir, counsel for Colorado announced that it would file a motion to dismiss that portion of the Kansas claim.[15] By stipulation, the Colorado motion was filed and briefed during the 1991 recess occasioned by Mr. Durbin's illness.

The motion was based upon the ground that Kansas had failed to demonstrate that the operation of the Trinidad Project resulted in a compact violation. Colorado argued that Article IV-D of the Arkansas River Compact specifically allows future development in Colorado, by federal or state agencies, including dams and reservoirs, provided that such development does not cause a material depletion in the usable flows of the Arkansas River to users in Kansas, and that Kansas had failed to establish the necessary depletion.

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[15] Although Kansas had not rested its entire case, its counsel indicated that Kansas had completed evidence on the Trinidad Project. RT Vol. 78 at 138, 144-45.

The Kansas legal theory was based upon the alleged violation of certain Operating Principles that were approved by the Arkansas River Compact Administration for the operation of the Trinidad Project. Kansas did not attempt to show a material depletion at the Stateline. Kansas took the position that any failure to abide by the Operating Principles constituted a compact violation; that during the initial period of operation of Trinidad Reservoir (from 1979 to 1984) the tributary inflows from the Purgatoire River into John Martin Reservoir on the Arkansas River were substantially less in certain months than they would have been if the Operating Principles had been strictly observed; and that Kansas was entitled to 40% of the water thus lost to the Arkansas River.

After extensive briefing and oral argument, and subject to confirmation by the Court, the Colorado motion was granted. A copy of my decision, dated June 9, 1992, is included in this Report as Part III.

H. Dismissal of Colorado Counterclaims.

During the 1991 summer recess, Kansas filed a motion to dismiss Colorado's two counterclaims. These were designated as the "Lake McKinney Counterclaim" and the "Well Counterclaim." The motion was filed under the guidance provided by Rule 41(b) of the Federal Rules of Civil Procedure.[16] While Colorado had not yet fully

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[16] Effective December 1, 1991, the vehicle for the result sought by the Kansas motion would be Rule 52(c) rather than Rule 41(b). However, the evidence was taken and briefing completed before the new rule took effect.

rested its case, its evidence on the Lake McKinney Counterclaim had been completed, and my ruling on the Well Counterclaim was not made until that evidence was also complete.

The Lake McKinney Counterclaim was based upon the allegation that Kansas had stored water released from John Martin Reservoir in Lake McKinney in Kansas, in violation of Article V-E(2) of the compact. I found that the Colorado evidence did not establish such a compact violation. Subject to confirmation by the Court, the Kansas motion to dismiss this counterclaim was granted. A copy of my decision, dated April 20, 1992, is included in this Report as Part IV.

Colorado's Well Counterclaim was based on the allegation that development of postcompact wells in Kansas had reduced the usable flow of the Arkansas River in Kansas by causing increased seepage or transit losses; that such losses had resulted in increased demands by Kansas against its storage account in John Martin Reservoir; and that the surplus in the Kansas Transit Loss Account was thereby reduced, 24/35ths of which would otherwise have been distributed to Colorado users. I found against Colorado on this counterclaim, and subject to confirmation by the Court, I granted the Kansas motion to dismiss. My decision, dated July 31, 1992, is included in this Report as Part V.

SECTION IV

DESCRIPTION OF THE ARKANSAS RIVER SYSTEM

The Arkansas River originates on the easterly slopes of the Rocky Mountains upstream of Leadville at elevations above 12,000 feet. The river flows south past the towns of Buena Vista and Salida, then easterly through the Royal Gorge to Canon City, and then into Pueblo Reservoir just upstream from the City of Pueblo. The elevation at Pueblo is 4,662 feet. From Pueblo the river meanders easterly across the Colorado high plains into Kansas. The elevation at the Stateline is 3,350 feet. Long-time USGS measurements at Canon City have been used consistently to represent the mainstream flows from the mountains. The portion of the river system that is involved in this litigation extends from Pueblo, Colorado to Garden City, Kansas. A general location map of the Arkansas River Basin in Colorado and Western Kansas is included in the back cover pocket of Volume I of this Report.[17]

The river valley between Pueblo and the Stateline, a distance of about 150 miles, is a fertile agricultural area with only a few small rural towns. Going downstream from Pueblo, the towns are La Junta, Las Animas, Lamar, Granada and Holly. In Kansas, the character of the land along the river continues to be agricultural. Between the Stateline and Garden City, the distance is approximately 62 miles. Substantially all of the normal surface flows of the Arkansas River are diverted and used by the time the

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[17] Submitted by the parties by letter dated February 21, 1994 for inclusion here.

river reaches Garden City. The river must rely upon more generous downstream tributaries and precipitation for its renewal.

In Colorado, the main tributary is the Purgatoire River, which joins the Arkansas from the south at Las Animas just upstream from John Martin Reservoir. The Purgatoire originates high in the Sangre de Cristo mountains about 40 miles upstream of Trinidad. Like the mainstream, it is fed by runoff from melting snow, and above Trinidad the flows are perennial. The other major contributors to the Arkansas from the south are the St. Charles, Huerfano, and Apishapa Rivers. The flows from these streams are intermittent and come primarily from intense summer rainstorms, although the drainage area of each of these streams includes some mountainous regions.

The major Colorado tributaries from the north are Fountain, Adobe, Horse and Big Sandy Creeks. These streams also are normally intermittent and dependent upon summer rains. With the exception of Fountain Creek, these streams drain the high plains territory and are not as productive as the southern tributaries.

The bed of the mainstream below Pueblo lies in a broad, sandy and frequently shifting channel. In Colorado, the river channel consists of the "valley fill aquifer." This aquifer fills a U-shaped trough cut into bedrock, which includes shale, limestone and sandstone. The valley fill aquifer, often referred to simply as alluvium or alluvial materials or aquifer, is highly permeable.[18] It ranges in width from about one to fourteen miles, with an

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[18] These terms were used interchangeably by witnesses at trial.

overall average width of approximately three miles. Thickness of the aquifer reaches more than 200 feet, but with an average depth of about 30 feet. The groundwater in the valley fill aquifer is in hydraulic continuity with the surface flows of the river. They constitute a common water supply. Jt. Exh. 66 at 2; Jt. Exh. 94 at 51. Thus, groundwater supports and contributes to the surface flows of the river, but pumping by wells can draw water away from the river. Jt. Exh. 157 at 11; Jt. Exh. 91 at 3; Jt. Exh. 94 at 1, 51, 53; RT Vol. 30 at 59.

Surface flows of the Arkansas River in Colorado are diverted by 23 major canal companies, which then distribute water to individual farmers. In addition, since 1949 when the compact was approved, farmers in Colorado according to Colorado data have constructed more than 1,300 large irrigation wells located in the valley fill aquifer. Colo. Exh. 165*, Table A.1. The number is even larger according to Kansas. These wells are largely pumped to supplement surface supplies. Surface and groundwater together provide irrigation supplies for more than 300,000 acres between Pueblo and the Stateline. Colo. Exh. 823, 827-30.

In certain reaches of the river in Colorado, the river alluvium is flanked by bench areas of older, less permeable deposits. Colorado describes these as "surficial aquifers," while Kansas simply calls them "bench aquifers." In any event, these areas are part of the tributary groundwater supply. Wells located in these areas are not as productive as those drawing from the valley fill aquifer.

In Kansas, the Arkansas River roughly parallels U.S. Highway 50, and passes through the towns of Coolidge,

Syracuse, Kendall, Lakin, Deerfield, Holcomb and Garden City. Kan. Exh. 471; RT Vol. 27 at 50. The distance from the Stateline to Garden City is approximately 62 miles. *Id.* at 52. Originally eight canal companies in Kansas diverted surface flows of the Arkansas River in this reach. Today the Alamo and Fort Aubrey ditches no longer operate, although the lands formerly irrigated by these ditches continue to be irrigated by wells. RT Vol. 28 at 15. The ditch companies remaining in operation between the Stateline and Garden City are: the Frontier, Amazon,[19] Great Eastern, South Side, Farmers and Garden City. Kan. Exh. 389**; RT Vol. 27 at 51-52. In 1988, approximately 57,000 acres were irrigated by surface diversions and alluvial wells. Kan. Exh. 358*; RT Vol. 31 at 57. The primary crops raised are corn, wheat, grain sorghums, alfalfa and soybeans. RT Vol. 27 at 60.

The river alluvium in Kansas between the Stateline and Garden City extends on both sides of the river, generally 1 to 1.5 miles, although a greater distance in some parts. RT Vol. 28 at 65. The thickness of alluvium ranges between 35 and 50 feet. *Id.* at 64. Between the Stateline and the Bear Creek fault zone, the Arkansas River and its associated alluvium occupy a trough eroded through bedrock. RT Vol. 29 at 134. The Bear Creek fault zone, however, cuts across the river just west of Lakin in mid-Kearny County and divides the Arkansas River Valley in Kansas into two distinct parts.[20]

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[19] This is the common name. Technically it is the Kearny County Farmers Irrigation Association Ditch. RT Vol. 27 at 96.

[20] The Bear Creek fault zone is about 48 miles from the Stateline. Jt. Exh. 139.

Upstream, as I have indicated, the river alluvium is underlain by bedrock which is essentially non-waterbearing. Downstream of the fault zone, however, the river alluvium overlies another lower aquifer, generally referred to as the Ogallala. The Ogallala formation is about 275 feet deep in Kearny County and 350 feet deep in Finney County. RT Vol. 28 at 76-77. Since the early 1960s most new or replacement wells have been drilled down to the bottom of the Ogallala. *Id.* at 68. The service areas of the canal companies virtually all overlie alluvium, except for the Great Eastern and Farmers. Kan. Exh. 407-12. Some portions of the ditch service areas also overlie the Ogallala. RT Vol. 28 at 18.

Surface flows of the Arkansas River are also augmented by diversions from the westerly slopes of the Rocky Mountains. Water users in the Arkansas River Basin in Colorado began such importations at the turn of the century, using tunnels and ditches to bring the water across the Continental Divide. RT Vol. 14 at 131 *et seq.* Jt. Exh. 5, Table 10. The Fryingpan-Arkansas project, authorized by Congress in 1962, substantially augmented those private facilities and increased the amounts of water imported. The Fryingpan-Arkansas project includes Ruedi Reservoir on the western side of the Continental Divide, four dams and reservoirs on the eastern slopes of the Rockies (Turquoise Lake, Mt. Elbert, Twin Lakes and Clear Creek Reservoirs) and Pueblo Reservoir on the Arkansas River just west of Pueblo, Colorado. Jt. Exh. 88 at 4.22-4.23. Over the 1950-85 period, transmountain imports have added an average of approximately 60,000 acre-feet per year to the Arkansas River. The Arkansas River Compact excludes such transmountain diversions,

and Kansas makes no claim to them, or to the return flows therefrom. Article III-B; RT Vol. 11 at 127.

SECTION V

DESCRIPTION OF MAJOR STORAGE AND DIVERSION WORKS

A. Surface Diversion Systems.

Surface flows of the Arkansas River in both Colorado and Kansas are diverted and distributed for irrigation through a number of canal companies. Often they are referred to as "ditches," but this friendly colloquialism greatly underplays the size of their facilities and operations. Colorado calculated that surface diversions by the various canal companies between Pueblo and the Stateline averaged 884,881 acre-feet annually for the 1950-85 period. Colo. Exhs. 838, 839. These systems include major diversion structures, as well as distribution and off-stream storage facilities. In Colorado there are 23 canal systems with rights to take water from the Arkansas River between Pueblo and the Stateline. Nine of these canals are located below John Martin Reservoir.

In Kansas, beginning about 1880, eight canals were developed with rights to divert Arkansas River water in the reach from just above the Stateline to Garden City. All of the data on Stateline flows have been adjusted to include Kansas diversions on the Colorado side of the line. Only six of those canals continue to be in operation. Diversions for 1950-88 averaged 78,742 acre-feet annually. Kan. Exh. 371*.

B. Wells.

In addition to the surface diversion systems, a large number of wells have been drilled in both states, most of them after the compact was approved in 1949. In 1985, the evidence showed a total of 2,062 permitted and decreed irrigation wells in Colorado, associated with 171,614 acres. Colo. Exh. 165*, Tables A.1-A.3. These were large wells of 100 gpm or more pumping from the Arkansas River and its associated alluvium, and from the surficial aquifer. In Kansas, a 1988 study found that a total of 16,679 acres between the Stateline and Garden City were being irrigated by wells pumping alluvial groundwater. Kan. Exh. 358* at 1.

C. Canal Company Storage Reservoirs.

Four of the canal systems in Colorado (Holbrook, Fort Lyon, Amity and the Colorado Canal) have off-channel reservoirs providing storage. These include Lake Henry and Lake Meredith; the Holbrook, Dye, Adobe Creek and Horse Creek Reservoirs; and the Great Plains Reservoir System. Colo. Exh. 824. The total storage capacity of these various private systems is in the order of 800,000 acre-feet. Colo. Exh. 3 at 3-12. However, they are relatively shallow and evaporation is extremely high. All of these Colorado canal company reservoirs operate under the Colorado appropriation system with various priority dates. All were in place prior to the Arkansas River Compact.

In Kansas, there is only one small reservoir, Lake McKinney. It is located near Garden City and has a current capacity of approximately 3,600 acre-feet, although it was somewhat larger in earlier years.

D. Trinidad Reservoir.

Major storage on the Arkansas River system is also provided by three federal reservoirs, namely, Trinidad Reservoir on the Purgatoire River, and Pueblo Reservoir and John Martin Reservoir on the mainstream. The Trinidad Project resulted from cooperative studies by the Corps of Engineers and the Bureau of Reclamation in the early 1950s. At first, Kansas opposed the project, stating that "even the most conservative estimates indicate an increased depletion of Purgatoire River water." Jt. Exh. 34 at XV. However, after certain operating principles were approved, Kansas withdrew its opposition. The project was approved by Congress in 1958, and was completed and ready to store water in 1977. Jt. Exh. 35 at 309; Jt. Exh. 23 at 4. The total capacity of the reservoir is in the order of 114,000 acre-feet, providing both flood control and water conservation storage. Jt. Exh. 24a. As already noted, during the trial Kansas pursued a claim for injury based upon an alleged violation of the operating principles adopted for the reservoir. Subject to confirmation by the Court, I have dismissed that claim in a separate decision included as Part III of this Report.

E. Pueblo Reservoir.

Pueblo Reservoir, located on the mainstream of the Arkansas River just above the City of Pueblo, is the

terminal reservoir of the Fryingpan-Arkansas project. That project was authorized by Congress in 1962, and construction of Pueblo Reservoir was substantially completed in 1975. Colo. Exh. 3, Table 2.1. The Fryingpan-Arkansas project is administered by the Southeastern Colorado Water Conservancy District, organized under the laws of Colorado. It is the legal agency responsible for repayment of the reimbursable costs of the project. The 1977 capacity of Pueblo Reservoir was estimated at 357,678 acre-feet. Besides providing flood control, Pueblo Reservoir is used primarily for the regulation of transmountain water imported from the westerly side of the Rocky Mountains under the Fryingpan-Arkansas project. However, the reservoir is also used to store native wintertime flows that are used later for summer irrigation under the Winter Water Storage Program. Colo. Exh. 532. Whether the operation of the Winter Water Storage Program has caused a material depletion in Stateline flows was one of the principal trial issues. The program was begun in 1976 and has been in operation since that time, except for the year 1978.

Pueblo Reservoir also has an independent right to store and retain native flows, with an appropriation date of 1939. However, this right comes into priority only when John Martin is full and all other diversion rights between Pueblo and John Martin have been satisfied. In essence, the right applies only during periods of major flooding. Jt. Exh. 129 at 46.

F. John Martin Reservoir.

John Martin is the largest of the federal reservoirs, located on the mainstream of the Arkansas River about 58 miles above the Stateline. The reservoir was authorized by Congress in 1936, and construction began in 1939. 49 Stat. 1570 (1936), codified at 33 USC §§ 701 *et seq.* After an interruption in construction caused by World War II, the dam and reservoir were completed in 1948. RT Vol. 15 at 35-36. Total storage capacity was approximately 700,000 acre-feet upon completion. 420,000 acre-feet of this capacity was allocated for conservation storage, and 280,000 acre-feet for flood control. Jt. Exh. 16 at 37. Because of sedimentation, however, the conservation storage capacity as of 1988 has been reduced to approximately 338,000 acre-feet. RT Vol. 16 at 126.

Developing criteria for the operation of this reservoir was one of the principal purposes of the Arkansas River Compact. Article V specifically provides how water will be stored and released from the reservoir. The compact creates a "conservation pool" to be operated "for the benefit of water users in Colorado and Kansas, both upstream and downstream from John Martin Dam . . . ." Article IV-C(3). During the winter months, all water entering the reservoir is stored in the conservation pool, except that Colorado has the right to releases equivalent to the river flow up to 100 cubic feet per second ("cfs"). Article V-A.

During the summer, defined as April 1 to October 31, no flows may be stored in John Martin Reservoir when Colorado water users are operating under judicially decreed priorities. Article V-B. Under these conditions,

Kansas is not entitled to any portion of the river flow entering John Martin Reservoir, but is apportioned whatever river flow may cross the Stateline. Article V-G. Downstream from John Martin, the return flows from Colorado users in the area, as well as occasional tributary inflow, contribute to the flow of the river reaching the Stateline.

When Colorado water users are not operating under decreed priorities, all summer flows entering the reservoir are stored, provided that Colorado may demand releases of water equivalent to the river flow up to 500 cfs, and Kansas may demand releases of water equivalent to that portion of the river flow between 500 cfs and 750 cfs. Article V-B.

Under the compact, neither state is allocated a specific share of the water stored in the conservation pool. Rather, such stored water constitutes a common resource to be released ". . . upon demands by Colorado and Kansas concurrently or separately at any time during the summer storage period." Article V-C. Specific release rates are provided for each state, depending upon the amount of water in storage. The only limit, however, upon the total amount of water that either state may take is the requirement that such water must be applied promptly to beneficial use, unless storage thereof downstream is authorized by the compact administration. Article V-E(2). Thus, water demanded by the first state to call automatically reduces the supply available to the other state. As a result, both states in recent times have generally demanded simultaneous releases at maximum rates in order to ensure that they would receive their share of stored water, even though all parties might not be ready

for delivery. Jt. Exh. 129 at 47; RT Vol. 66 at 54; RT Vol. 81 at 127-29; RT Vol. 133 at 76.

In practice, operation under the compact resulted in the storage of most, if not all, of the inflow from November 1 to March 31. In many years at the end of the winter storage season, the reservoir storage was completely drawn down early in the irrigation season, sometimes by mid-April. Jt. Exh. 129 at 47.

In 1980 the Arkansas River Compact Administration adopted a resolution concerning the method of operating John Martin Reservoir. It is entitled "Resolution Concerning an Operating Plan for John Martin Reservoir" and is included as Exhibit 10 in the Appendix, as revised in 1984. Jt. Exh. 21, Doc. 11. The resolution abandons the common pool concept in favor of allocating specific state shares in the stored water. Under the 1980 Operating Plan, 40% of the stored water goes into a separate "Kansas account," while 60% is divided in varying shares among the nine Colorado canal companies located within Colorado Water District 67. *Id.*, Section II-D(2)(3). Kansas and the various Colorado ditches may demand release of the water contained in their respective accounts at any time and at whatever rates they desire. *Id.*, Section II-E(1).

The 1980 Operating Plan also allows three Colorado canal companies, namely, Amity Mutual Irrigation Company, Fort Lyon Canal, and Las Animas Consolidated Canal Company, to store certain "other water" in John Martin Reservoir. *Id.*, Section III-A,B,C. The permitted storage consists of water which Amity could otherwise divert from the Arkansas River and store in the Great Plains Reservoir System, and water which the other two

canal companies could store under an approved Pueblo Winter Storage Plan. *Id.*, Section III-A,B,C.

In exchange for this storage right, the three Colorado canal companies agreed to a 35% water surcharge on all their deliveries into John Martin Reservoir. *Id.*, Section III-D. This 35% goes into a Kansas Transit Loss Account. Releases of stored water from the Kansas account are measured at the Stateline, and transit losses between John Martin and the Stateline are made up from this Kansas Transit Loss Account. *Id.*, Section II-E(4).[21]

G. Transmountain Diversions.

Flows in the Arkansas River have long been supplemented by transmountain diversions imported from the western slopes of the Rocky Mountains. The earliest of these diversions began in the 1880s. Colo. Exh. 3, Table

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[21] The 1980 Operating Plan, as revised on May 10, 1984 and December 11, 1984, is currently in effect. However, the resolution continues on a year-to-year basis, and may be terminated by either state. Section VII-A. Witnesses from both states supported its continued operation. Nonetheless, in its Pre-trial Statement, at pages 165-166, Kansas took the position that:

> ". . . while Kansas believes that the 1980 Resolution results in a more efficient operation of John Martin Reservoir . . . the resolution is an administrative rewriting of Article V of the Arkansas River Compact and thus is *ultra vires* and legally void *ab initio*."

During the trial itself Kansas did not appear to pursue this position. However, in its post-trial briefs Kansas still takes the position that 1980 Operating Plan, although beneficial, is beyond the powers of the compact administration and hence is "illegal." Kan. Reply Br. at 17, 22. This matter is discussed further in Section XIV of this Report.

3.11; Jt. Exh. 5, Table 10. Between 1890 and 1910 a number of tunnels and ditches and three reservoirs in the headwaters area were constructed. During the period 1908-42, imports averaged only 11,987 acre-feet annually. But about 1935 transmountain diversions began to increase significantly, and during the compact negotiations they were averaging approximately 43,000 acre-feet per year. Jt. Exh. 16 at 37; Jt. Exh. 5, Table 10. Not all of the transmountain imports, however, are used along the Arkansas River. These diversions also supply the cities of Aurora and Colorado Springs.

The Fryingpan-Arkansas Project was approved by Congress in 1962. Construction began in 1963 and was virtually complete by 1980, but diversions through the Charles Boustead Tunnel, a part of the project, began in 1972. Since 1972, total transmountain imports through the Fryingpan-Arkansas Project and the various other systems have averaged about 120,000 acre-feet per year. RT Vol. 21 at 25. Estimates of the average amounts delivered for use within the Arkansas River Valley during the 1950-85 period range between 56,210 and 60,445 acre-feet annually. Colo. Exh. 846.

SECTION VI

ARKANSAS RIVER SUPPLY

Most of the hydrologic data analyzed and presented by both states covered the period from 1950 through 1985. The first year after the approval of the compact was 1950, and this action was commenced at the end of 1985. This period of time was also used by Kansas in its hydrologic-institutional model and by Colorado in its water budget analysis. However, certain older reports that included river flow data from earlier years were also submitted into evidence, particularly with respect to the mainstream inflow at Canon City before Pueblo Reservoir was constructed, and the river flows at the Stateline.

Both states used measurements just downstream from Pueblo Reservoir to represent the supply of the mainstream. These data included some transmountain imports, and in more recent years also reflected the impact of storing winter flows in Pueblo Reservoir for later release. However, the total amount of water available for downstream use includes more than just the mainstream inflow at Pueblo. Tributary inflow, releases from other downstream reservoirs, groundwater, precipitation, and return flows from stream diversions and groundwater pumping all add to the total Arkansas River water supply available in Colorado.

A. Mountain Inflow.

While the amounts of tributary inflow and groundwater pumping were sharply contested during the trial, the two states essentially agreed upon the mainstream supply at Pueblo. Kansas computed the average annual

flow to be 585,157 acre-feet for the 1950-85 period, while Colorado put the average at 582,805. Colo. Exh. 831.[22] These data include transmountain imports and the inflow from Fountain Creek. The difference over this period of time is not material for the issues in this case. Most of this water comes from melting snow, and the flows are largest during the spring and early summer. Winter flows are relatively low. Precipitation downstream of Pueblo averages only 12 inches a year, although it increases toward the east and into Kansas. Jt. Exh. 105 at 7. Eighty percent of the precipitation occurs during the growing season of April through October, but without irrigation, rainfall is not sufficient to mature crops. Jt. Exh. 105 at 7.

The estimates by the two states of deliveries of transmountain water during the 1950-85 period were also close. These delivery figures are somewhat less than the total amounts of water imported from the western slope of the Rockies since some of that water is used outside of the Arkansas River area, some is lost to reservoir evaporation, and in a given year water is sometimes held over

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[22] These figures can be compared with longer-term averages at Canon City, where the river emerges from the mountains. An engineering committee report prepared for the compact negotiations shows an average annual flow at Canon City of 514,300 acre-feet for the period 1908-42. Jt. Exh. 5, Table A at 13 and 9. A 1968 Colorado report computes the Canon City annual average at 518,000 acre-feet for the years 1924-66. Jt. Exh. 92 at i. Another Colorado report done in 1975 estimates the 1935-50 average annual flow at 509,400 acre-feet, and the 1951-72 average at 513,600 acre-feet. Jt. Exh. 94 at 49. Transmountain imports increased in the later postcompact years.

in storage. Kansas estimated 60,445 acre-feet as the average annual amount of transmountain water delivered to the Colorado canal companies for irrigation use during the 1950-85 period. The best comparable Colorado estimate was 56,210 acre-feet. Colo. Exh. 846. Kansas makes no claim to this transmountain water. RT Vol. 11 at 127. It is specifically excluded from the Arkansas River Compact. Article III-B. Nonetheless, return flows from such imports still affect downstream flows and use.

Considering only native Arkansas River flows, that is, excluding transmountain imports, the mainstream supply does not show a significant historic decline. Declining flows at the Stateline cannot be explained by a comparable decrease in the mainstream inflow from the mountains. Colorado maintains, however, that the inflows from the tributaries have declined.

B. Stateline Flows.

The flow of the Arkansas River at the Colorado-Kansas Stateline is well gaged, and the states do not dispute these measured amounts. Colo. Exh. 4*, Table 5.8; Colo. Exh. 920. However, the gage measurements reflect total flows, including flood flows. Occasionally there are brief but high-intensity thunderstorms that produce large volumes of water which are not usable, but which nonetheless can significantly influence any simple arithmetical average. Moreover, the controlling provision in the Arkansas River Compact requires that upstream development shall not materially deplete the "usable quantity or availability" of water for use in Colorado or Kansas. Article IV-D. Thus Kansas' rights must ultimately be

judged in terms of usable flows, which were a major issue during the trial. However, for the purpose here of a general view of river supplies, unadjusted gage figures are used.

For the 1950-85 period, Stateline flows averaged 144,051 acre-feet per year. Colo. Exh. 4*, Table 5.8; Colo. Exh. 730. Colorado acknowledges that the Stateline flows have declined.[23] During the dry decade of the 1970s, flows averaged only 72,203 acre-feet annually. Colo. Exh. 4*, Table 5.8. The average for the last 20 year period which included wet years is still only 117,823 acre-feet. *Id.*, calculated for years 1966-85.

Earlier reports show considerably higher flows. For example, the Interim Report of the engineering committee prepared during the compact negotiations showed that Stateline flows averaged 280,800 acre-feet annually over the 1908-42 period. Jt. Exh. 5, Table D at 16. Even during an earlier dry decade, 1931-40, they averaged 146,200 acre-feet. *Id.* In a 1944 settlement plan proposed by C. L. Patterson, the Chief Engineer of the Colorado Water Conservation Board, average Stateline flows for 1908-38 were given as 260,700 acre-feet per year. Jt. Exh. 8 at 22. Colorado also submitted these same flow numbers

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[23] See the testimony of one of Colorado's chief experts at RT Vol. 114 at 115-16; also RT Vol. 115 at 73-76. Mr. Helton testified that the decline since 1950 was due to a combination of causes: a decrease in tributary inflow, an increase in consumptive use by phreatophytes, and "partly because of post-Compact well pumpage." RT Vol. 114 at 116. He agreed there was a "trend of increase in depletions to state line flows." RT Vol. 133 at 57-58.

to the Special Master in 1941 during earlier Supreme Court litigation. Kan. Exh. 379 at 2.

Similar figures were used in a 1961 Bureau of Reclamation Report for 1921-56 showing an average of 262,000 acre-feet annually. Colo. Exh. 113 at 6. According to a 1968 report prepared for the Colorado State Legislature, Stateline flows for 1924-42 averaged 194,000 acre-feet.[24] Jt. Exh. 91 at 10. A 1974 USGS report shows an annual average of 210,000 acre-feet for the years 1941-65. Jt. Exh. 78. In 1975 the Colorado Division of Water Resources issued a report which compared average Stateline flows for the periods 1935-50 and 1951-72, showing a decline from 280,900 acre-feet annually to 171,300. Jt. Exh. 94 at 49. Over the same periods, inflow at Canon City increased slightly. *Id.* After construction of John Martin Reservoir some decline in Stateline flows was to be expected. Kansas understood during the compact negotiations that it would get less total flow, but that its supplies would be better regulated and more usable. Kan. Exh. 129, Vol. II at 383.

C. Tributary Inflows.

One of the issues in the case is the extent to which tributary inflows to the mainstream have declined and thus may partially account for Stateline depletions. The issue is not easily resolved since the only tributaries that have been consistently gaged are Fountain Creek, and the

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[24] This average excluded the extraordinarily high flows of 1942, which were estimated at more than 1.3 million acre-feet.

Apishapa and Purgatoire Rivers. These latter two tributaries drain about 4,429 square miles, but approximately 15,272 square miles lie within the drainage areas of the other tributaries. Colo. Exh. 4*, Table 1.2. During the trial Kansas attempted to estimate the ungaged tributary inflow by developing a rainfall-runoff model based on certain correlations, the output of which was fed into its integrated hydrological-institutional model. Colorado was critical of both the Kansas methodology and results, but used its own water budget analysis to develop ungaged tributary flows as the residual of the budget process. It is perhaps sufficient to note at this point in the Report that the states are in lively disagreement over the ungaged flow from the various tributaries.

D. Overappropriated Surface Supplies.

The surface flows of the Arkansas River in Colorado are greatly overappropriated, and decreed surface rights suffer frequent shortages. *Fellhauer v. People*, 167 Colo. 320, 447 P.2d 986 (1968); Jt. Exh. 157 at 9. Lands under a majority of the canals experience moderate to severe shortages of surface water after June, when the snowmelt is generally gone. Jt. Exh. 92 at i. In fact, the river was fully appropriated before the turn of the century, and in most years there is not enough water to provide a full irrigation season supply for any priority dates after 1880. RT Vol. 76 at 42-43, 108-09; Kan. Exh. 16; Jt. Exh. 105 at 34.

A Colorado expert witness also testified that the effective surface water supply in Colorado averaged 720,533 acre-feet annually during 1950-85. Colo. Exh. 727*; RT Vol. 116 at 33-35. These surface supply figures include tributary inflow as well as mainstream flows

from the Rocky Mountains, but do not include groundwater. The headgate diversion requirements of the Colorado canals for the same period were estimated at 1.18 million acre-feet per year. *Id.* Diversion requirements were based on a "full water supply," that is, the amount of water needed for "optimum crop production." RT Vol. 82 at 162. Colorado witnesses consistently characterized the system as being "water short." RT Vol. 82 at 46, 163; RT Vol. 116 at 34; RT Vol. 65 at 127, 147, 152; RT Vol. 71 at 81; RT Vol. 72 at 99-100; RT Vol. 76 at 42; RT Vol. 77 at 19.

When permitted by their priority rights, canal companies in Colorado frequently divert the full flow of the river. Canals with senior rights like Fort Lyon often "sweep the river," that is, take all the surface flow available at their headgates. RT Vol. 82 at 43; RT Vol. 66 at 129; RT Vol. 78 at 124. Surface flow must then be restored from return flows, precipitation, downstream tributary inflow, and releases from downstream storage. That becomes the supply for downstream users with later priorities. Diversion and rediversion of normal streamflows sometimes leaves long reaches of the river dry, or nearly so. Jt. Exh. 96, Vol. I at 25. One Colorado expert testified that basically all of the snowmelt is diverted or used in Colorado, either for irrigation or by phreatophytes and reservoir evaporation. RT Vol. 66 at 36-38, 41.

Following World War II, the development of new well technology (the high capacity turbine pump), together with the availability of cheap power, led to a great increase in the number of wells along the Arkansas River. Prior to 1957 a well could be drilled in Colorado without any kind of water right permit, and even after that time, the issuance of a permit was ministerial. Before

1965, a new well could not be denied on the basis of injury to prior vested rights. RT Vol. 76 at 25, 41, 100. Well pumping thus became the way to supplement inadequate surface supplies. And pumping from such postcompact wells became one of the principal issues in this case.

SECTION VII

MAJOR ISSUES AND CLAIMS OF THE PARTIES

There are two ultimate issues left to be decided in this Part I of the Report: (1) whether the increase in groundwater pumping in Colorado since the adoption of the Arkansas River Compact has violated the compact, and if so, to what extent; and (2) whether Colorado[25] has violated the compact through the implementation of the Winter Water Storage Program, and if so, to what extent. Kansas' claim arising from the operation of Trinidad Reservoir was dismissed earlier, subject to confirmation of the Court. A copy of that decision dated June 9, 1992 is included in this Report as Part III.

Colorado's two counterclaims, designated as the Lake McKinney Counterclaim and the Well Counterclaim, were also dismissed previously, subject to confirmation of the Court, by decisions dated April 20, 1992 and July 31, 1992. These decisions are included as Parts IV and V, respectively, of this Report.

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[25] The allegations in the amended complaint run against Colorado, although the WWSP is operated in Pueblo and John Martin Reservoirs, federal facilities, with the consent of the United States. The amended complaint actually refers to Colorado's rejection of the Arkansas River Compact Administration resolution of July 24, 1951, allegedly requiring that any reregulation of the native water of the Arkansas River be approved by the compact administration. I granted Colorado's motion for partial summary judgment on this legal issue, by order dated September 15, 1989 (Part II of this Report), but reserved for trial the factual issues "concerning any impact of the winter storage program on Kansas' entitlement under the Compact."

In its First Amended Complaint, Kansas also alleges that Colorado has failed and continues to fail to make deliveries of releases to which Kansas is entitled from John Martin Reservoir by an equivalent in Stateline flow, as required by Article V-E(3) of the compact, and in violation of Articles V-E(4) and V-H(2). However, these provisions were not separately addressed during the trial, apart from the overall claim of material depletions of Stateline flows caused by postcompact pumping and the WWSP.

More specifically, the major issues remaining and the claims of the parties are:

(1) *Burden of Proof.* Kansas states that this is a compact enforcement case, not an equitable apportionment proceeding, and that the ordinary preponderance of the evidence standard applies. Colorado and the United States, on the other hand, contend that the appropriate test is "clear and convincing proof."

(2) *Meaning of the Compact.* Kansas asserts that the compact achieves the equitable apportionment of the Arkansas River that was not made by the Supreme Court in the two prior interstate cases.[26] In the Kansas view, the essential apportionment provisions are: Article IV-D which preserves the usable flows that were available to Kansas at the time of the compact, as well as those which have or may become available as a result of the compact; and Article V which apportions the normal summer

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[26] *Kansas v. Colorado*, 206 U.S. 46, 51 L.Ed. 956, 27 S.Ct. 655 (1907); *Colorado v. Kansas*, 320 U.S. 383, 88 L.Ed. 116, 64 S.Ct. 176 (1943).

flows, and the new usable flows resulting from the construction and operation of John Martin Reservoir. It is the Kansas position that Article IV-D includes not only wells constructed after the compact, but also increased pumping from precompact wells. Colorado contends that the compact provides for a flexible and indeterminate apportionment based upon the right of both states to make demands for releases from John Martin Reservoir. With respect to wells with precompact dates of appropriation, Colorado asserts that Article VI-A(2) allows the amount of pumping to increase beyond precompact levels.

(3) *Equitable Defenses.* Colorado asserts that Kansas is subject to laches and related equitable defenses, and should be barred from complaining about the effects of well development which occurred in Colorado prior to 1965. In the alternative, Colorado asserts that this delay in complaining should "gravely add to the burden" that Kansas otherwise would bear, and must be weighed in considering the equities of the case. It is the Kansas position that laches does not apply as a matter of law in a case of this kind, and that it has not been established by the facts in any event. During argument on my Draft Report, Colorado contended that equity should at least preclude damages for any wrongful pumping prior to approximately 1975, although such argument did not include a bar to prospective relief.

(4) *1980 Operating Plan.* Colorado contends that the benefits accruing to Kansas under the 1980 Operating Plan approved by the Arkansas River Compact Administration should offset and bar any claim by Kansas for breach of the compact after 1980; moreover, that such benefits more than offset the impact of wells constructed

east of the Buffalo Canal headgate after 1965. During oral argument on my Draft Report, however, Colorado asserted that at the very least the 1980 Operating Plan should mitigate any damages for the period after 1980. Kansas argues that Article VI of the 1980 plan precludes these Colorado contentions; that Kansas' benefits under the 1980 plan were separately bargained for and may not be used to offset Stateline depletions; that Colorado also received substantial benefits under the plan; and that the plan goes beyond the legal authority of the compact administration and may not be relied upon by Colorado to defeat the Kansas claims. Moreover, Kansas argues that Colorado's position with respect to the 1980 Operating Plan would amount to an unlawful modification of the compact by the Arkansas River Compact Administration. Colorado responds that it does not claim that the compact can be altered without congressional approval, but rather that the voluntary conduct of Kansas may be considered in determining whether Kansas is entitled to enforce an equitable right or remedy.

(5) *Precompact Pumping*. Both states acknowledge that a certain amount of precompact pumping was "grandfathered" under the compact, and should not be considered in connection with the Kansas claim based on depletions caused by wells. Kansas conceded pumping of 11,000 acre-feet annually, that is, the amount of pumping which it estimated occurred in 1948. Colorado contends the Kansas figure is legally wrong, as well as being factually incorrect. Colorado instead adopted an approach based on claimed entitlements under Colorado law and Article VI-A(2) of the compact. The amounts of this claimed exempt pumping varied year by year, but

according to Colorado averaged 49,275 acre-feet over the 1950-85 period. If a single figure is to be used to represent precompact pumping, Colorado contends that early estimates used by the USGS and others are low, and that the amount should be on the order of 36,000 acre-feet annually. Both states agree that the entitlement of precompact wells is a legal question.

(6) *Total Amount of Pumping.* Both states estimated the amount of water pumped primarily through the use of electric power records, although pumping from non-electric wells (natural gas, diesel, etc.) was also calculated. Total pumping for the 1950-85 period was estimated by Kansas to be 5,810,000 acre-feet; the Colorado figure for the same period was 5,227,000 acre-feet.

(7) *Computer Modeling and Depletions from Pumping.* Much of the trial was spent in highly technical disputes among experts concerning the various computer models that were used to isolate and estimate the impacts of pumping and the WWSP. Kansas experts, after making substantial revisions to the original hydrologic-institutional model, estimated total depletions of usable Stateline flow for the 1950-85 period from both pumping and the WWSP at 489,000 acre-feet. Colorado and the United States subjected the reliability of the H-I model to relentless attack, criticizing not only the data and assumptions used in the model, but also its basic structure. The United States questions whether the revised H-I model results meet threshold standards for admissibility. Colorado's own combined groundwater models and water budget analysis, however, also show substantial Stateline depletions from pumping. Colorado contends that upstream of John Martin Reservoir these depletions have been largely

offset by return flows from transmountain imports, and downstream by benefits from the 1980 plan.

(8) *Usable Flow.* Article IV-D of the compact provides that future development or construction shall not materially deplete the waters of the Arkansas River "in usable quantity or availability for use to the water users in Colorado and Kansas under this Compact." Kansas presented evidence on three alternate methods to reduce depletions of total Stateline flow to depletions of usable flow. Colorado experts raised objections to each, offered changed values for one methodology if it were to be used, but presented no usable flow analysis of their own after 1969.

(9) *Well Development in Kansas.* Colorado contends that Kansas' "predicament" is largely due to its own failure to regulate postcompact pumping in Kansas. The issues are whether pumping in Kansas affects water that comes within the provisions of the Arkansas River Compact, and whether users in Colorado are adversely impacted within the meaning of the compact by such postcompact pumping in Kansas.

(10) *Winter Water Storage Program.* The fundamental issue is whether the WWSP, which operated during 1976-85 except for 1978, caused material depletions of usable Stateline flow. Kansas claims that such depletions amounted to 40,000 acre-feet over the whole period of time. Both the United States and Colorado dispute this figure, claiming that the results of Kansas' modeling effort are not accurate or reliable, and that the program increased Stateline flows if accretions are considered. As subsidiary issues, Kansas maintains that Colorado used

the wrong period of time during which to analyze the program. Colorado simulated operation of the WWSP over the historic period of 1950-75. It did not analyze the program for the years when it was actually operated. Kansas, on the other hand, examined the years of actual operation, but assumed that the 1980 Operating Plan was not in effect during 1980-85. Both the United States and Colorado objected to this assumption. Finally, Colorado urges that Kansas has acquiesced in the development and implementation of the WWSP, and should not now be heard to complain.

SECTION VIII

BURDEN OF PROOF

A. The Issue.

There is no question of course that Kansas, as plaintiff, must prove its case. There is a serious question, however, concerning the relative weight of evidence which Kansas must produce to satisfy that requirement. Specifically, Kansas contends that it need meet only the "preponderance of the evidence" test applicable to ordinary civil litigation. Colorado and the United States, on the other hand, contend that the appropriate test is "clear and convincing proof." This controversy may be important because of the many factual issues in the case, especially the issues surrounding Kansas' effort to construct a computer model of the Arkansas River system and to demonstrate Stateline depletions through the use of that model.

B. Nebraska v. Wyoming.

Although it may be only dictum the Supreme Court's unanimous decision last year in *Nebraska v. Wyoming*, 507 U.S. ___, 123 L.Ed.2d 317, 113 S.Ct. 1689 (1993), is so recent and so relevant that I necessarily take it as the starting point in determining the burden of proof Kansas faces in the present case. The Court has again stated its long-standing rule that in litigation within the original jurisdiction, a state seeking equitable apportionment of an interstate stream must present clear and convincing proof of some real and substantial injury or damage. (507 U.S. at ___, 123 L.Ed.2d 317 at 329, 113 S.Ct. 1689 (1993)

citing *Idaho v. Oregon*, 462 U.S. 1017, 1027, 77 L.Ed.2d 387, 397, 103 S.Ct. 2817 (1983); *Colorado v. Kansas*, 320 U.S. 383, 393, 88 L.Ed. 116, 123-24, 64 S.Ct. 176 (1943); *Connecticut v. Massachusetts*, 282 U.S. 660, 669, 75 L.Ed. 602, 607, 51 S.Ct. 286 (1931).

The *Nebraska* case involves a new refinement of the rule. The opinion states that where a Supreme Court decree has been issued in an interstate river apportionment case, a state instituting a later proceeding to *enforce* the decree need not meet the strict standard of proof applicable in the initial proceeding. 507 U.S. at ___, 123 L.Ed.2d at 330-31, 113 S.Ct. 1689 (1993). On the other hand, a high degree of proof will still be required of a party asking to *modify* such a decree, since a state proposing modification "essentially seeks a reweighing of equities and an injunction declaring new rights and responsibilities." *Id.* A resulting question addressed in the latest briefs in our own case is whether or not the Arkansas River Compact is analogous to a Supreme Court decree, so that Kansas' suit may be viewed as one to enforce the compact and therefore as a proceeding subject to a less demanding evidentiary test than clear and convincing proof.

C. Background.

In approaching this issue, two background matters should be noted.

First, what the Court in the *Nebraska* case refers to as the "legal standard" for litigation between states (that is, the requirement that the complaining state present clear and convincing evidence) is a latecomer on the scene. For

over a century following ratification of the constitution, the Court does not appear to have adopted any burden of proof rule applicable to all state-vs-state cases. In a number of the opinions in that period the Court commented on the strong showing required of a given state, but such remarks involved either particular types of disputes, e.g., *Virginia v. West Virginia*, 78 U.S. (11 Wall.) 39, 63, 20 L.Ed. 67, 73 (1871) (state action based on local election), or cases where the showing of an opposing state was especially strong so that the burden of proof was not significant. E.g., *Rhode Island v. Massachusetts*, 45 U.S. (4 How.) 591, 638, 11 L.Ed. 1116, 1137 (1846) (boundary); *Indiana v. Kentucky*, 136 U.S. 479, 518, 34 L.Ed. 329, 336, 10 S.Ct. 1051 (1890) (boundary); *Virginia v. Tennessee*, 148 U.S. 503, 523, 37 L.Ed. 537, 544, 13 S.Ct. 728 (1893) (boundary). *Missouri v. Illinois*, 200 U.S. 496, 521, 50 L.Ed. 572, 579, 26 S.Ct. 268 (1906), appears to be the first case to articulate this strict rule. Justice Shiras' 1901 opinion overruling the demurrer (180 U.S. 208, 248, 45 L.Ed. 497, 515, 21 S.Ct. 331) mentioned in dictum that, because Missouri sought an injunction based on nuisance, the evidence would have to be "determinate and satisfactory." But in 1906, after evidence was presented, Justice Holmes referred back to the Shiras "intimation" (200 U.S. at 518, 50 L.Ed. at 577) and went on to announce a burden of proof rule applicable generally to actions between states – "clearly and fully proved." 200 U.S. at 521, 50 L.Ed. at 579.

In hindsight, it is fair to observe that the evidence of river contamination in *Missouri v. Illinois* was very complex and controversial, and that it required no special burden of proof to deny relief. Nor was it necessary to state a rule going beyond the nuisance context. Moreover,

the only citation given in support of the new standard was the ruling on demurrer in *Kansas v. Colorado*, 185 U.S. 125, 46 L.Ed. 838, 22 S.Ct. 552 (1902), an opinion which did not make that point. And following trial, the final opinion in *Kansas v. Colorado*, 206 U.S. 46, 51 L.Ed. 956, 27 S.Ct. 655 (1907), also omitted reference to a strict burden of proof. Instead (206 U.S. at 97, 51 L.Ed. at 975), Justice Brewer stressed the equality of the two states:

> "One cardinal rule, underlying all of the relations of the states to each other, is that of equality of right. Each state stands on the same level with all the rest."

See also *Connecticut v. Massachusetts*, 282 U.S. 660, 670, 75 L.Ed. 602, 607, 51 S.Ct. 286 (1931).

Later litigation involving sewage and drainage (*New York v. New Jersey*, 256 U.S. 296, 309, 65 L.Ed. 937, 943, 41 S.Ct. 492 (1921); *North Dakota v. Minnesota*, 263 U.S. 365, 374, 68 L.Ed. 342, 345-46, 44 S.Ct. 138 (1923)), echoed the rule of *Missouri v. Illinois*, and by the time of *Colorado v. Kansas* in 1943 there was a line of similar precedents. 320 U.S. at 393, note 8, 88 L.Ed. at 124. The rule is now "longstanding." Yet there has been no real explanation of the suitability of a strict burden of proof for equitable apportionment cases.

Second, on an interstate stream, the downstream state will normally be the complaining party. As such it will also invariably be the party which is required to present a very strong case in order to obtain relief. In contrast to actions involving private water rights, the Court's special rule for burden of proof in equitable apportionment cases adds a significant legal inequality to

the natural inequality already imposed by geography. The ideal of federalism – that each state is on an equal footing with all the other states – seems poorly served by a rule which routinely penalizes all downstream states.

D. The Compact.

These background matters aside, I can see no reason why an interstate compact should have any less standing in this respect than a decree of the Court. It is often said that the Court's authority over the states is a substitute for the war and treaty powers which they possessed before adoption of the constitution (*Rhode Island v. Massachusetts*, 37 U.S. (12 Pet.) 657, 725, 9 L.Ed. 1233, 1260 (1838); *Kansas v. Colorado*, 185 U.S. 125, 140, 46 L.Ed. 838, 844, 22 S.Ct. 552 (1902); *North Dakota v. Minnesota*, 263 U.S. 365, 372-73, 68 L.Ed. 342, 345, 44 S.Ct. 138 (1923); *Idaho v. Oregon*, 462 U.S. 1017, 1031, note 1, 77 L.Ed. 2d 387, 400, 103 S.Ct. 2817 (1983)), but the compact alternative is no less effective a substitute for those powers and clearly is no less constitutionally authorized. A compact is approved by the legislatures of the affected states and by Congress. Indeed, the Court itself has frequently urged contending states to negotiate compacts *rather than* resorting to the jurisdiction of the Court. See *Colorado v. Kansas, supra*, 320 U.S. 383, 392, 88 L.Ed. 116, 123, 64 S.Ct. 176 (1943); *New York v. New Jersey*, 256 U.S. 296, 313, 65 L.Ed. 937, 945, 41 S.Ct. 492 (1921). Undoubtedly one reason for that admonition is that the compact procedure provides an important ingredient which the Court itself cannot provide – the consent of all the parties. Both Colorado and Congress consented to the rights and duties set forth in the compact; neither may now be heard

to claim that those rights and duties ought to be harder to enforce than they would be if contained in a decree of the Court.

E. "Enforcing" the Material Depletion Standard.

The Court's detailed discussion in *Nebraska v. Wyoming* indicates a willingness to consider individual provisions of the decree in terms of this enforcement-vs-modification analysis. 507 U.S. at ___, 123 L.Ed.2d at 330, 113 S.Ct. 1689 (1993). The decree in that case was much more detailed in its statement of rights and duties than the more general provisions of the Arkansas River Compact, but, as I conclude in my discussion of Article IV-D of the compact, I believe the agreed concept of material depletion is a meaningful and practical standard for dividing the resources of the river. Just as with a preexisting decree of the Court, the rights and duties stage of this dispute has been concluded; the present proceedings involve enforcement of those rights and duties.[27] Accordingly, the burden of proof which Kansas must now satisfy is the traditional one of ordinary civil litigation, that is, preponderance of the evidence.

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[27] The Supreme Court has jurisdiction to enforce an interstate compact, as well as to declare rights under the compact and to determine compliance. *Texas v. New Mexico*, 462 U.S. 554, 567, 575-76, 77 L.Ed. 2d 1, 103 S.Ct. 2558 (1983).

SECTION IX

BACKGROUND OF THE COMPACT

The meaning of the Arkansas River Compact cannot be fully understood apart from the rich history of controversy over the river, and the early efforts to apportion its waters between the two states. Nor can its meaning be divorced from the views of men in both states who fought the apportionment issues for more than a decade before taking seats on the compact commission to undertake formal compact negotiations.

The compact makes no specific quantitative allocation of river flows, either in amounts or in terms of shares in the supply. It does not specify how flows had been divided and used in the past. Nor does it make specific reference to the pumping of tributary groundwater from wells. And yet the compact relies upon continued agreement between the states in administering the compact to achieve its stated purpose, that is, to "Equitably divide and apportion" the river flows and the benefits arising from John Martin Reservoir. Article I-B. Under these circumstances, and as a supplement to the compact language and the record of compact deliberations, the background history becomes highly useful in helping to understand the intent of the compact commissioners. Certainly the compact was in part shaped by this history.

Kansas' first witness during the trial was Douglas R. Littlefield, Ph.D., a research historian and consultant. His qualifications, including numerous publications and awards, are set forth in Kansas' Exhibit 484. Dr. Littlefield began his work for Kansas in the spring of 1986. The result of that effort was a 462-page, two-volume report

entitled "The History of the Arkansas River Compact." Kan. Exh. 129. His review encompassed hundreds of thousands of pages of archival material.[28] Dr. Littlefield

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[28] The sources are described generally as follows: "Comprehensive research was undertaken at the National Archives (Washington, D.C.) in the records of the Bureau of Reclamation, the U.S. Geological Survey, the Department of the Interior, the U.S. Supreme Court, the Natural Resources Planning Board, and the Federal Power Commission. Other work was done at the Federal Records Center in Houston, Texas, in the records of the U.S. Army Corps of Engineers. Further research was conducted in the Kansas State Historical Society (Topeka) in the Kansas governors' papers between 1900 and 1950, in the personal papers of Congressman Clifford R. Hope (who represented western Kansas between 1927 and 1957), in the records of the Kansas State Board of Agriculture's Division of Water Resources, and in the Kansas attorney general's files (including the attorney general's records relating to *Colorado v. Kansas*). Additional work was undertaken at the Colorado Historical Society (Denver) in the records of the Arkansas Valley Ditch Association (which represented water users in Colorado's part of the river basin) and in the Michael C. Hinderlider Papers. (Hinderlider was Colorado's state engineer during much of the period under study.) Work was also done at the presidential library of Franklin D. Roosevelt in Hyde Park, New York, and in the presidential library of Harry S. Truman in Independence, Missouri. Research was also carried out at the University of Colorado (Boulder) in the personal papers of U.S. Senator Gordon L. Allott and Congressman Edgar J. Chenoweth, both from Colorado. (Allott was a prominent attorney from southeastern Colorado who served in the U.S. Senate from 1955 to 1973, and he was a law partner with Arthur C. Gordon, who

was on the witness stand for some twelve days, including extensive cross-examination. While Colorado disagrees with some of his conclusions, and while some of his opinions were stricken as legal conclusions, I believe that the accuracy and thoroughness of his historical presentation generally hold up well. Colorado offered no historical expert in opposition.

A. Early History.

Following Kansas' failure to gain more water from Colorado in the 1907 Supreme Court decision,[29] a number of private actions were filed against users in Colorado. One of these filed in 1910 by a Kansas plaintiff sought a

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represented the Fort Lyon Canal Company, a major Arkansas River water user. Gordon also served as a special assistant attorney general in *Colorado v. Kansas*. Chenoweth represented southeastern Colorado in the House of Representatives from 1941 to 1949 and again from 1951-1965.) Further archival work was undertaken in the files of the Arkansas River Compact Administration (the organization created by the compact to administer the agreement's daily operation) in Lamar, Colorado.

"In addition to research in these historical archives, more document review and analysis was done at Bureau of Reclamation's offices in Colorado, in Montana, and in Washington, D.C., and research was undertaken in Kansas state government offices in Topeka and Garden City. Finally, research was also conducted in many published primary sources, including Congressional reports and various state government publications." Kan. Exh. 129 at 12-13.

[29] *Kansas v. Colorado*, 206 U.S. 46, 51 L.Ed. 956, 27 S.Ct. 655 (1907).

decree establishing the priorities of individual diverters along the Arkansas River regardless of the boundary between the states.[30] The objective of this action contrasted sharply with the equitable apportionment between the two states sought earlier by the State of Kansas. The case was settled in 1916, giving the various Kansas ditches specific diversion rights with a priority date of 1910, the year the action was filed. Kan. Exh. 141. The various Kansas ditches had actually begun to take water in 1879 and in the early 1880s. Kan. Exh. 129, Vol. I at 37. However, the settlement essentially confirmed the use of water in the two states as it then existed. Future appropriations in Colorado were subordinated to the rights of the Kansas diverters. The Purgatoire River was then relatively unappropriated, and so future Colorado interference with that source of supply was checked. *Id.* at 36.

This settlement was rejected by Kansas' Finney County Water Users' Association (Farmers' Ditch), and in 1916 it filed its own action against Colorado users. The litigation was later expanded to include tributary users, and testimony was heard throughout the early 1920s. In 1921 another settlement approach was made. This stemmed from a letter from Delph E. Carpenter, a highly respected Colorado water lawyer, to the Kansas Attorney General. Carpenter proposed negotiating an interstate compact so that both the states and their users would be

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[30] *United States Irrigating Co. v. Graham Ditch Company, et al.*, Case 5578, U.S. District Court for District of Colorado; Kan. Exh. 129 at 33-34.

bound. As a result, both states passed legislation authorizing the appointment of a commission to negotiate a compact. Carpenter represented Colorado, and Kansas named George S. Knapp, who later became the Kansas Chief Engineer and head of its Division of Water Resources. Some 20 years later Knapp was to become the chairman of the Kansas delegation that actually negotiated the Arkansas River Compact. By 1925 Carpenter and Knapp had drafted a tentative compact which was submitted to irrigation interests in both states for their comments and recommendations. Kan. Exh. 144.

The proposed compact recognized that virtually all of the normal flows of the mainstem (not including irregular flood flows) were being diverted by Colorado ditches. It did not attempt to change that situation, and thus Colorado farmers would have assurances that their existing uses would not be subject to continued legal threats. As for Kansas' irrigation problems, Knapp and Carpenter tried to find a remedy through use of water from the Purgatoire River. Kansas was given the right to build a major reservoir on the Purgatoire in order to store up to 120,000 acre-feet of water. With certain minor exceptions, Kansas would have the right to this stored water, but subject to a reservation in favor of Colorado of 10,000 acre-feet for users in the Arkansas River Valley. Kan. Exh. 129, Vol. I at 42-43. However, according to Knapp, this reservation had been inserted for discussion purposes only and Knapp opposed it. *Id.* at 44. Whether as a result of this issue or not, the proposed compact went no further. Meanwhile the Finney County Water Users Association lawsuits continued to move ahead at a slow pace.

In 1928, therefore, the State of Colorado brought an action in the United States Supreme Court to enforce the earlier judgment in *Kansas v. Colorado*, and to halt the prosecution of the private litigation. That case was ultimately decided by the Court in *Colorado v. Kansas*, 320 U.S. 383, 88 L.Ed. 116, 64 S.Ct. 176 (1943).

B. Development of Caddoa Reservoir.[31]

The historic 1921 flooding of the Arkansas River, which caused extensive damage from Pueblo to Garden City, became the catalyst for yet another approach to solving the water problems of the two states.[32] The Colorado State Engineer, Michael C. Hinderlider, proposed the possibility of a reservoir on the mainstream near Caddoa. Hinderlider saw this facility as serving the dual purpose of flood control and also possibly helping to solve the interstate struggle over allocation. Colorado began preliminary studies on its own, but also sought federal involvement and support.[33] In the same general time frame, Colorado officials and water users were also

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[31] Named for the small town of Caddoa, Colorado, where the reservoir was proposed to be located. In 1940 the name was changed to John Martin Reservoir in memory of the Congressman who represented southeastern Colorado from 1909 to 1913 and again from 1933 to 1939, and who was highly influential in obtaining federal authorization and funding for the reservoir. Congressman Martin died in 1939. Kan. Exh. 208, Consent Decree at 5.

[32] See pages 47-49 of Kan. Exh. 129, Vol. I, for photographs of the 1921 flood damage.

[33] Colorado's Caddoa Dam survey was completed by Hinderlider in 1928. Kan. Exh. 129, Vol. I at 53.

exploring additional transmountain diversions in order to augment their irrigation supplies.[34] To some extent, these transmountain plans competed with the Caddoa project for support and funding.

Efforts to obtain federal funding for the Caddoa project were marshalled through a Caddoa Dam Committee organized in 1933. This committee included not only high ranking Colorado officials but also influential representatives of water users. Among these was Henry C. Vidal, a Denver lawyer who represented the Arkansas Valley Ditch Association. Vidal was also one of Colorado's attorneys in *Colorado v. Kansas*, and later became chairman of the Colorado delegation to the commission that negotiated the Arkansas River Compact.

The committee recognized that federal aid was unlikely unless the Caddoa project also had Kansas' support. Kan. Exh. 129, Vol. I at 64-66. Negotiations with Kansas were again resumed. Colorado representatives were prepared to give assurances that the new reservoir could not be used to bring new lands under irrigation.[35]

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[34] That effort eventually led to the Bureau of Reclamation's Fryingpan-Arkansas Project in 1962. Public Law 87-590, 87 Cong., 2d Sess. (Aug. 16, 1962), 76 Stat. 389.

[35] A 1933 report by Hinderlider stated that about 325,000 acres in Colorado were irrigated from the Arkansas River downstream of Pueblo. Kan. Exh. 162. He put the Kansas acreage at approximately 65,000 acres. *Id.* A report from the Kansas Attorney General to the Governor, also in 1933, estimated that Kansas ditches had been receiving on average about 60,000 acre-feet of water annually from the river to irrigate 70,000 acres of land. Kan. Exh. 155. Knapp understood, however, that a prohibition against new irrigated acreage would not necessarily limit water

Kan. Exhs. 150, 153, 163-65, 129 at 78-79. But Kansas was seeking more, namely, a definite allocation of the flows below the reservoir. Kan. Exhs. 153, 157, 158. A tentative accord acceding to Kansas' demands was reached at a September, 1933 meeting in Wichita. Principal participants at this meeting included Vidal, Knapp and C. L. Patterson who later became the Chief Engineer for the Colorado Water Conservation Board. Patterson, along with Vidal and Knapp, was also appointed later to the negotiating commission for the Arkansas River Compact. After further negotiations, the agreement was finalized in writing on December 18, 1933.

C. Stipulation of 1933.

The agreement of December 18, 1933 was drafted in the form of a stipulation to be filed in the pending *Colorado v. Kansas* litigation. Kan. Exh. 167. However, the stipulation was not to be filed until construction of Caddoa Dam and Reservoir was assured. Each state pledged to use its influence so far as practicable to obtain construction of the reservoir by the United States, and the water allocation provisions of the stipulation were to become effective only when Caddoa Dam had been constructed and water was stored in the reservoir. *Id.* at 3, 5.

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use in Colorado. He noted that water use could be increased through wells. Moreover, many farmers in Colorado did not have sufficient water to irrigate all of their land each year. Consequently one field would be watered one year and another the next. If water could be obtained, the amount of land actually irrigated in any given year could be increased without showing any increase in "irrigated acreage." Kan. Exh. 205.

The stipulation was also made without prejudice to the claims of either state in *Colorado v. Kansas*, and was specifically made subject to the decision of the Supreme Court in that case. *Id.* at 5.

The stipulation provided that construction and operation of Caddoa should not "disturb the status quo of the diversion of water for beneficial uses from said Arkansas River by the ditches and canals now constructed and operated in both of the States of Colorado and Kansas." *Id.* at 3. In order to "maintain the status quo," Kansas was allocated 77,000 acre-feet annually at the Stateline. 52,000 acre-feet were to be delivered during the irrigation season from April 1 to October 1, with the remaining 25,000 acre-feet being delivered during the nonirrigating season. *Id.* at 3. For the irrigation of lands in Colorado located below the reservoir, 160,000 acre-feet annually were allocated to Colorado. These allocations applied to the normal flows of the Arkansas River that were to be released through the new reservoir, and corresponded generally to the amounts of water that had been used. Kan. Exh. 129, Vol. I at 83-84. Any shortages were to be prorated between the states in proportion to their respective allocations. The "additional water" to be stored in the reservoir was said to constitute "surplus" and was allocated one-half to Colorado and one-half to Kansas. Kan. Exh. 167 at 4. Release of such stored water was not considered part of the specific acre-feet allocations made to the states.

Caddoa Dam and Reservoir were authorized by Congress in 1936, and full funding for the project was provided in 1938. Kan. Exhs. 182, 183, 129, Vol. I at 106-07.

D. Proposed Consent Decree in Colorado v. Kansas.

Despite the cooperative efforts between the states in support of the Caddoa project, proceedings in *Colorado v. Kansas* continued to move slowly. Testimony was taken from 1932 to the end of 1939.[36] Kan. Exh. 129, Vol. I at 122, 125. In 1937, however, counsel for the two states, A. W. McHendrie for Colorado and W. E. Stanley for Kansas, began to discuss settlement. McHendrie initially proposed a consent decree in the Supreme Court action based upon the stipulation of 1933. *Id.* at 126. McHendrie thought that such a settlement would be fair and would give the Kansas ditches ". . . a controlled supply of water equal to that which they had been getting throughout their history." *Id.* at 127.

Stanley, however, believed that the 1933 stipulation was only an interim measure and that Kansas was entitled to larger flows under any permanent settlement. He wanted to see the 77,000 acre-feet allocation in the 1933 stipulation increased to 100,000 acre-feet. Nonetheless, negotiations proceeded and ultimately the settlement assumed a different form. Based on agreement among counsel, McHendrie and Henry C. Vidal in 1941 prepared a Stipulation and Final Decree, generally referred to as a Consent Decree, to be filed in the Supreme Court proceedings. Kan. Exh. 208.

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[36] The record consisted of 36 volumes of testimony and some 316 exhibits. Kan. Exh. 129, Vol. I at 125.

The proposed decree provided that Kansas would get 25% of the streamflows of the Arkansas and Purgatoire Rivers between April 1 and September 30, as measured near Parkdale, Colorado (above Pueblo at the head of Royal Gorge), and at the mouth of the Purgatoire. This share of river flow was in contrast to the acre-foot allocation included in the 1933 stipulation, although Littlefield testified that the 25% figure was in fact based upon the amounts that had been flowing into Kansas. RT Vol. 4 at 46. Measuring the Kansas share upstream protected it against intervening development and served the same purpose as the guaranteed amount under the 1933 stipulation. Any imported water was not to be counted in determining the Kansas share.

During winter months, Kansas was to have 25% of the total flows up to 25,000 acre-feet, plus water for storage at Lake McKinney. Kansas could elect to store any of its waters at John Martin Reservoir, provided that it did not use more than one-third of the total conservation pool. The Kansas allocation was measured at the State-line, subject to certain corrections. Flows over 2,000 cfs, and volume of more than 25,000 acre-feet in any winter season, were considered "undivertible" and were not chargeable against Kansas.

Although the proposed consent decree had been prepared by Colorado's attorneys in *Colorado v. Kansas*, and was quickly approved by the Finney County Water Users' Association and Kansas' Associated Ditches, it was opposed by C. L. Patterson, the Chief Engineer for the Colorado Water Conservation Board. Patterson prepared an extensive analysis, including a great deal of water supply and usage data, which is in evidence as Kansas

Exhibit 208. A copy of the proposed consent decree is attached to Patterson's analysis. Essentially, Patterson believed that the consent decree awarded too much water to Kansas, and would require existing Colorado uses to be cut back. Kansas, he thought, would be assured of "largely increased supplies of usable water" and "all the conservation benefits of Caddoa Reservoir." Kan. Exh. 208 at 3, 5. On the other hand, it would "require limitations upon diversions and uses heretofore and now being made by Colorado appropriators." *Id.* at 5.

Patterson noted that the allocation in the 1933 stipulation, in contrast, "will not disturb the status quo of diversions in either State." *Id.* at 9. The 1933 stipulation also divided the quantities of water conserved from streamflows previously wasted, "in addition to the supplies required to maintain the status quo of downstream diversions." *Id.* at 10. Patterson maintained that during the 1908-38 period, ditch diversions in Kansas averaged 84,500 acre-feet per year. *Id.* at 36. He noted that these historical averages were approximately the same, although slightly greater than the "status quo" values used in the 1933 stipulation. *Id.* For this same 1908-38 period, his data indicated that 740,000 acre-feet, or 74% of the total water available, was consumptively used in Colorado.

Based upon Patterson's views, the Arkansas Valley Ditch Association in Colorado rejected the proposed settlement. This action was taken despite strong support from Henry C. Vidal in favor of the proposed consent decree. Kan. Exh. 209. Vidal pointed out that the Supreme Court proceedings involved a determination of the

respective rights of the two states in the equitable benefits of the Arkansas River, "whether measured by actual quantities of water or otherwise . . ." *Id.* at 3. More than a mere division of benefits of Caddoa Reservoir was involved. In his opinion, the proposed consent decree was "the most favorable Colorado can get and should be approved." *Id.* at 8.

While the Arkansas Valley Ditch Association in Colorado rejected Vidal's recommendation, it still encouraged talks to continue toward a more acceptable decree. As a result, Colorado officials met again in March, 1942. Those present included Colorado Governor Ralph Carr; Attorney General Gail Ireland; Colorado Water Conservation Board Director Clifford H. Stone; Stone's legal counsel, Jean S. Breitenstein; Stone's Chief Engineer, Charles Patterson; and Attorneys Arthur Gordon, A.W. McHendrie, and Henry Vidal. All except the Governor were subsequently involved in the compact negotiations, either as commissioners or as advisors.

Negotiations were in fact renewed. Colorado pressed for modifications in the consent decree, lowering the amount of storage capacity in John Martin Reservoir used by Kansas, and seeking the right of Colorado to construct additional reservoirs upstream from John Martin, subject to protections for Kansas. Kan. Exh. 212. However, the changes were not acceptable to Kansas. Kan. Exh. 213. A final effort at settlement was then made by Patterson, who developed a proposal known as "Patterson's Plan F." Kan. Exh. 214. Plan F still dealt with apportionment of the flows historically diverted in the two states, together with a division of the flows to be conserved by John Martin. Kan. Exh. 129, Vol. I at 153-158. However, this plan also

was rejected by Kansas. *Id.* at 159. Under Plan F, Stateline flows in excess of 2,000 cfs during the summer, or 40,000 acre-feet per month, or 160,000 acre-feet per season, were not considered usable and were not charged against the Kansas allocation. *Id.* at 157. As to further upstream development in Colorado, Plan F provided that:

> "[E]nterprises constructed in Colorado in the future shall not divert or store waters of the interstate stream under priorities or decrees dated hereafter except at such times as the conservation pool in Caddoa Reservoir is filled to within 40,000 acre feet of its water holding capacity . . ." *Id.* at 158.

E. The Supreme Court Decision in Colorado v. Kansas.

Time finally ran out on the efforts to agree upon a consent decree. Charles L. Cavanah, the Special Master appointed to hear the case, made his recommendations to the United States Supreme Court on May 1, 1943. Kan. Exh. 215. In a cryptic series of findings without discussion of the evidence, the Special Master found that the "average annual dependable and fairly continuous water supply" of the Arkansas River and its tributaries amounted to 1,110,000 acre-feet. *Id.* at 10. Of this flow, he awarded 925,000 acre-feet to Colorado, and 185,000 acre-feet to Kansas. *Id.* at 11-12. When flows either exceeded or fell short of the dependable average, the allocations were to be prorated. Both states filed exceptions to the Master's recommendations. Kansas was ready to accept the 185,000 acre-feet per year allocation since it was well beyond what had been sought in previous negotiations.

Nonetheless, Kansas objected to its inability to obtain water when the users demanded it. Colorado, as might be expected, objected to the basic apportionment itself and argued that the proposed allocation would cause serious damage to its interests.

The Court found that the Master had erred in attempting to divide what he designated as the "average annual dependable" water supply. Kan. Exh. 216 at 392. The Master did not define floodwaters or the extent to which they were unusable by either state. Nor did the Master suggest any provision whereby the occurrence of floodwaters could be taken into account in defining Colorado's obligation to deliver water to Kansas. *Id.* at 390. The critical matter, said the Court, is:

> ". . . the amount of divertible flow at times when water is most needed for irrigation. Calculations of average annual flow, which include flood flows, are, therefore, not helpful in ascertaining the dependable supply of water usable for irrigation." *Id.* at 397.

Of more importance, the Court found that Kansas had not sustained its allegations that Colorado's use of water had materially increased, and that the increase had worked a serious detriment to the substantial interests of Kansas. *Id.* at 400. While the Master had found a material increase in river depletions by Colorado, his report did not state what he considered material, or the extent of the diminution of flow, or the interests of Kansas which had been injured and the extent of the injury. In reviewing the evidence, the Court found that it did not support a depletion in *usable* flows. *Id.* at 396, 398. The Court noted that the Kansas ditches were capable of diverting water only

up to 2,000 cfs. *Id.* at 396. Pointing out that irrigated acreage in Kansas had also increased, the Court did not find the requisite showing of serious injury. The Court mentioned the "great quantities of ground water" available in Kansas, but did not discuss the source or replenishment of such groundwater, nor any consideration of overdraft. *Id.* at 399.

Except to enjoin further proceeding in the private litigation, the Court denied relief.[37] Perhaps quietly recognizing that the maximum benefits from John Martin could be realized only by agreement, the Court directed the states back to the compact approach:

> "Such [interstate water] controversies may appropriately be composed by negotiation and agreement, pursuant to the compact clause of the Federal Constitution. We say of this case, as the court has said of interstate differences of like nature, that such mutual accommodation and agreement should, if possible, be the medium of settlement, instead of invocation of our adjudicatory power." *Colorado v. Kansas*, 320 U.S. 383 at 392.

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[37] According to one of the recitals in the proposed consent decree, Colorado in its bill of complaint had sought an "equitable apportionment and division of the benefits of the water of said Arkansas River and its tributaries . . . ." Kansas filed an answer and cross-bill for a determination of its share of the total water supply to be delivered at the Stateline. Kan. Exh. 208, Decree at 3.

F. Interim Operating Agreements, 1943-47.

By December of 1942, the year before the Supreme Court decision in *Colorado v. Kansas*, construction of John Martin Reservoir had proceeded far enough to allow limited conservation storage to begin. By March, 1943 some 40,000 acre-feet were in storage. Kan. Exh. 129, Vol. I at 168. Absent an agreement between the states, the Corps of Engineers intended to release this water. Responding to this pressure, Knapp and Hinderlider met with the Corps to discuss rates of release and a division of the stored water between Colorado and Kansas. By April 1943 the states agreed that the 1933 stipulation had become effective, since *Colorado v. Kansas* had not yet been decided. *Id.* at 170. Water then in storage was considered as direct streamflow and was divided 67.5 percent to Colorado and 32.5 percent to Kansas. Kan. Exh. 217.

In the following years until adoption of the Arkansas River Compact, additional agreements were made. The 1933 stipulation expired by its terms when the Supreme Court decision in *Colorado v. Kansas* was issued in December 1943. Subsequent agreements were often difficult to reach, but without agreement the parties were under threat that the Corps would simply release water from John Martin Reservoir, or even refuse such storage. The various proposals, negotiations and interim agreements are discussed in detail in Kan. Exh. 129, Vol. I at 162-215.

At times negotiations were in the hands of many of the leaders who later became compact commissioners.[38] At one time, when negotiations stalled, the two governors stepped in. Patterson, Vidal and Ireland all had separate plans, but none were acceptable to Kansas. The agreement for 1944-45, at the suggestion of Knapp, was finally patterned after the 1943 agreement. One-half of the water in storage was allocated to Kansas, together with the return flows and tributary inflow originating below John Martin Reservoir. Kan. Exh. 129, Vol. I at 200.

The last of these interim agreements was negotiated by William E. Leavitt (for Kansas) and H. B. Mendenhall (for Colorado). *Id.* at 210. Both of these men had been appointed as compact commissioners, and the compact negotiations were then underway. The Leavitt-Mendenhall accord provided that winter storage would begin November 1, 1946 and last until April 1, 1947. During this period of time, ditches in Colorado could call for water to be released from John Martin Reservoir for winter irrigation at flows not to exceed 100 cfs. However, any such winter releases were deducted from Colorado's share of summer storage releases. With some variations, stored waters were basically apportioned 600 cfs to Colorado and 400 cfs to Kansas. This ratio represented an adjustment from the traditional 67.5/32.5 division first established in the 1933 stipulation and used in earlier interim

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[38] In the spring of 1944, Attorney General Mitchell, Knapp and Roland H. Tate, the attorney for the Kansas Associated Ditches, were all involved on behalf of Kansas. For Colorado, their representatives included Attorney General Gail Ireland, Patterson and Vidal. All six of these persons became compact negotiators. Kan. Exh. 129, Vol. I at 176.

operating agreements. It was noted by Hans Kramer, the federal delegate to the compact deliberations, that the modification had been made at the suggestion of Charles Patterson to compensate for increased diversions in Colorado beyond the de facto status quo of 1943. *Id.* at 212-13.

The summer portion of the 1947 operating agreement provided that between April 1 and October 31, the Corps of Engineers would impound all flows exceeding 750 cfs. Of flows below that rate, Colorado would receive the first 500 cfs and Kansas the balance. Recognizing that the compact talks could extend into 1948 and beyond, Leavitt and Mendenhall also agreed that the terms of the 1947 agreement would continue to be used until a compact was reached, subject to the right of either state to cancel the interim accord in any year. *Id.* at 212-14.

G. Conclusions.

Throughout the many agreements and efforts to reach agreement between the states, certain principles appear fairly consistently. The first is the continuing effort to maintain the status quo, as it existed from time to time. This concept related to diversions by the ditch companies in both states, and to the acreage irrigated by them. None of the river allocations was intended to provide water to bring new lands under irrigation. But neither were they expected to deprive users of their existing supplies. While the Kansas allocation of the river was sometimes defined in terms of a specific acre-foot quantity, and sometimes as a percentage of river flow, and sometimes merely as a curb on future Colorado use, the objective was essentially the same. That is, the efforts

were generally to confirm, and to protect against future erosion, the de facto apportionment of river flows that had occurred.

Both states needed additional water even for currently irrigated lands. However, these needs were to be met insofar as possible from the construction of reservoirs to store floodwaters that would otherwise be lost. Primarily, of course, the states were dealing with John Martin Reservoir. Both states were to share in that new conservation storage, and this division was to be in addition to the apportionment of normal streamflows. Neither state contemplated that Kansas' share of conservation storage in John Martin Reservoir would be in lieu of its proper apportionment of the normal flows of the Arkansas River.

SECTION X

ARKANSAS RIVER COMPACT NEGOTIATIONS

Federal approval for negotiations of the Arkansas River Compact was enacted by Public Law 34, 79th Congress, approved April 19, 1945. The statute authorized Colorado and Kansas ". . . to negotiate and enter into a compact not later than January 1, 1950, providing for an equitable division and apportionment . . . of the waters of the Arkansas River and all of its tributaries . . ." Jt. Exh. 3 at 1-4. The legislation also directed the president to name a federal delegate to the compact negotiations, and on November 20, 1945, President Harry S. Truman appointed Hans T. Kramer as the federal representative. Jt. Exh. 3 at 1-3. Kramer was a retired Brigadier General with the Corps of Engineers and had served as a district engineer of the Corps in New Mexico.

The Colorado appointments to the commission were made by the Governor of Colorado on January 12, 1945, pursuant to legislation adopted in 1937. Jt. Exh. 3 at 1-5, 6. The initial Colorado appointees were: Henry C. Vidal, who represented the Arkansas Valley Ditch Association and had participated in *Colorado v. Kansas;* Charles Patterson, Chief Engineer of the Colorado Water Conservation Board; Gail L. Ireland, who had been Attorney General; and Harry B. Mendenhall, who was closely associated with the water users above John Martin Reservoir.

The Kansas appointments were authorized by legislation approved February 28, 1945 and the Kansas Governor made his appointments on March 7, 1945. Jt. Exh. 3 at 1-7, 8. The Kansas commissioners were: George S. Knapp, Chief Engineer of the Division of Water Resources; A. B.

Mitchell, Attorney General; Roland H. Tate, an attorney for the Garden City Company and Kansas' Associated Ditches and an early pioneer who was "born practically on the banks of one of those [Kansas] canals";[39] and William E. Leavitt, who was employed by the United States Irrigating Company. Mitchell was later replaced by Attorney General Edward F. Arn.

The compact commission held 17 meetings. The first meeting took place in Denver on January 7, 1946, and the last on December 13-14, 1948. The official "Record of Meetings" of the Arkansas River Compact Commission is in evidence as Jt. Exh. 3. In addition, a transcript of each meeting was made by a court reporter. The transcript was obtained from General Kramer's files in the National Archives, and is Joint Exhibit 4. The deliberations of the commission were closed to the general public, although certain key individuals were invited from time to time to attend and speak, and various drafts of compact articles were circulated for comment outside of the commission. General Kramer was elected chairman at the first meeting of the commission.

A. The Development of Article IV-D.

For purposes of this case, Article IV-D is the most significant compact provision. The basic issues remaining for this part of the Report are whether postcompact pumping in Colorado and the Winter Water Storage Program violated Article IV-D. This Article provides:

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[39] Jt. Exh. 15 at 20.

> "This Compact is not intended to impede or prevent future beneficial development of the Arkansas River basin in Colorado and Kansas by Federal or State agencies, by private enterprise, or by combinations thereof, which may involve construction of dams, reservoir, and other works for the purposes of water utilization and control, as well as the improved or prolonged functioning of existing works: Provided, that the waters of the Arkansas River, as defined in Article III, shall not be materially depleted in usable quantity or availability for use to the water users in Colorado and Kansas under this Compact by such future development or construction."

The first true draft of this Article appears to have been prepared by Kramer after the twelfth meeting of the compact commission, and distributed to the other commissioners by letter dated February 20, 1948. Kan. Exhs. 257, 258, 129 at 347-48. At that time, the Article was numbered IV F. It was renumbered as IV-D at the fifteenth meeting of the commission. Kan. Exh. 129 at 375, 377. The initial version was modified several times. Indeed, the last change occurred at the seventeenth and final meeting of the commission. Jt. Exh. 4 at 17-30. However, the essence of the proviso, namely, that there would be no material depletion of usable flows, remained constant.

B. Federal Development Plans.

Somewhat surprisingly, one of the major concerns during the first year of the compact negotiations dealt with the development plans of the federal government.

Article IV-D ultimately became the vehicle for addressing these issues.

In January, 1946 the Bureau of Reclamation released an ambitious report for the future development of the Upper Arkansas River. Kan. Exh. 241. Not only did the United States propose to integrate John Martin Reservoir into the Gunnison-Arkansas Project, but new reservoirs and developments, including power projects, were planned for the St. Charles, Huerfano, Apishapa, Fountain and Big Sandy Creeks, and for the Purgatoire River. These are all major tributaries to the mainstem of the Arkansas River in Colorado. A map showing the proposed development sites is included in Kansas Exhibit 129 at 265. Moreover, the federal plans called for the construction of wells "along the Arkansas River and elsewhere" in order to supply more irrigation water. Jt. Exh. 3 at 3-10. Imported water from the west side of the Rockies was expected to provide supplemental water for existing irrigated lands, and also to enable "the irrigation of a large area of new land." *Id.* at 3-9.

The compact commissioners were not unresponsive to the benefits that might result from appropriate federal development. But they also recognized that many of the federal goals ran counter to any compact that would maintain the status quo as to existing diversions and that would divide the benefits of floodwater conservation in John Martin. The commission tried a number of different approaches in an effort to reconcile future federal projects with protection to existing users. The earliest approach, suggested by Kramer, was to give the Arkansas River Compact Administration the right to comment on federal plans under the Flood Control Act of 1944. Jt. Exh. 3 at

5-19. That law made irrigation the primary use of water (as opposed to power development) and gave the states only the opportunity to comment on federal projects, and not the power to veto them. Kan. Exh. 129 at 256, 268.

Another method considered was the so-called "paramountcy" clause. Under this provision, upon ratification of the compact by Congress, the United States would be prevented from operating hydroelectric power plants or other works that would "conflict" with any irrigation or other consumptive use, present or future, in either state. *Id.* at 287, 256-57. Another alternative was the creation of a strong Arkansas River Compact Administration that would have authority through the paramountcy clause to pass judgment on future federal development proposals. *Id.* at 258. Another draft article at one time provided that water used by future development projects would be chargeable against the allocation of the state where the project was located. *Id.* at 287; Jt. Exh. 3 at 7-5. Draft Articles X and XI were the sections that included these various approaches.

Consideration of these issues did not occur without much discussion and correspondence with federal officials. However, by the twelfth meeting of the commission in February of 1948 still no language acceptable to both the federal government and the commission had been found. The commission decided therefore not to pursue Articles X and XI any longer. Jt. Exh. 3 at 13-5 to 13-9.

The issue of future federal construction, however, was not dropped. A draft Article IX then addressed a specific federal dam to be built near the mouth of the Purgatoire River. Kan. Exh. 129 at 336. Kramer, at the

same twelfth commission meeting, said that they needed to expand protection beyond the Purgatoire, that they should be concerned about "the effect of any upstream construction on the amount of water that reaches Caddoa." Jt. Exh. 4 at 12-53, 12-96. He suggested to Kansas that if it wanted "to protect or maintain the status quo" that Kansas itself "pick up the ball." Jt. Exh. 4 at 12-57. Kansas apparently responded with a rough draft of a compact that was later circulated to the commissioners, but does not appear in the official record of the commission meetings. Kan. Exh. 253, 257. The first time a full draft of the compact is set forth in the official record is in the record of the thirteenth meeting. Jt. Exh. 3 at 13-18 to 13-26.

Article IX had been reserved for the new reservoir near the mouth of the Purgatoire River. On the Kansas draft, however, that page bears the handwritten note: "Draft to be prepared by Kansas to cover general situation of depleting inflow to Caddoa." Kan. Exh. 253. It appears that Tate prepared a pencil draft which he gave to Kramer. Colo. Exh. 649; RT Vol. 13 at 45-47. In turn, Kramer "roughed out a preliminary draft" that was intended to permit future development with "adequate protection to John Martin Reservoir and the interstate compact apportionment," and sent it to Tate. *Id.* Kramer labeled the new Article as IV-F since he thought the subject fitted more naturally under Article IV. The draft Article IV-F was then sent by Tate to Secretary Noe for transmission to the other commissioners, which apparently occurred on February 20, 1948. Colo. Exh. 651; Kan. Exhs. 255, 257, 258, 129 at 347-48. That draft of what was to become Article IV-D read:

> "Future beneficial development of the Arkansas River Basin by Federal or State agencies, by private enterprise or by combinations thereof, may involve the construction of dams, reservoirs and other works for the purpose of comprehensive and coordinated water utilization and control as well as for the improved or prolonged functioning of existing works. This Compact is not intended to impede or prevent such beneficial development; provided, that the water herein apportioned between the States shall not be materially depleted in usable quantity nor adversely affected in seasonal availability without compensatory benefits to the water users in Colorado and Kansas under this Compact."

Thus, for the first time in the compact drafts, protection against material depletions addressed all future development, by the federal government or otherwise.

C. "Materially Depleted."

In its initial form Article IV-F provided that the water apportioned between the states would not be "materially depleted" by future development. Kan. Exh. 258. However, language developed by Vidal, Ireland and Kramer removed the qualification that any proscribed depletion be "material." Jt. Exh. 3 at 13-65. The modified proviso as it appears in the official record of the thirteenth meeting read:

> ". . . provided, however, that the water herein apportioned between the states shall not thereby be depleted in usable quantity or availability . . . ." *Id.* at 13-62.

The Colorado representatives and Kramer also deleted the phrase that flows would not be depleted "without compensatory benefits." Kan. Exh. 258; cf. Jt. Exh. 3 at 13-62.

In connection with these changes to Article IV-F, the commissioners discussed the meaning of the term "depleted" and what should be the yardstick for determining depletions. Vidal said that "depleted" meant the same as "diminished." Jt. Exh. 3 at 13-67. Kramer argued that any depletion should be measured against the "dependable or historic average of the flow at Caddoa." *Id.* at 13-69. Ireland agreed on the use of an average, that is, the flows that Caddoa would have impounded if upstream works had not been built. *Id.* at 13-66. Kramer also concurred in the use of a long-term average. *Id.* Knapp suggested using the same 35-year base period adopted by the engineering committee (1908-1942) but the idea of settling upon specific years was rejected by the others. There was no disagreement, however, with the principle that depletions would be determined on the basis of average prior flows. Kansas cautions, however, that the compact actually protects the "availability" as well as the amount of usable flow. Kansas argues that, in determining depletions, modern computers allow sophisticated techniques that were unavailable to the compact negotiators.

The term "materially" was reinserted in what was then Article IV-D at the seventeenth and final meeting of the compact commission. The request came from Mendenhall to remedy what he called a local situation in Colorado Springs. A reservoir there had developed a 6 cfs leak. The local people wanted to be sure that these flows

could again be impounded after repairs had been made. Jt. Exh. 4 at 17-30. Tate said it made no difference. "We have had it [material] in and out." *Id.* Kramer agreed, but on reflection he thought it might be better to restore the term. Otherwise, he said, "one teaspoonful of depletion might be interpreted too literally." *Id.* The use of "material" would avoid "an extreme interpretation." *Id.* There being no disagreement, "materially" was reinserted in the final form of the Article IV-D proviso.

Federal officials were also satisfied with this method of dealing with future construction, although the Article encountered some opposition among Colorado users who wanted to be able to claim a larger share of the river. Kan. Exhs. 274, 275; Jt. Exh. 3 at 13-106; Kan. Exh. 129 at 368-73.

D. Protection of Existing Uses.

Article IV-D clearly embraces new construction, but another part of the broader intent was to secure the existing supply of water for lands then irrigated and the existing division of that supply. In the discussions about Articles IV-F and IV-D, commissioners from both states were in easy agreement about their intent to maintain the status quo. Vidal said, "We are compacting about the present existing situation"; "We are trying to preserve a status quo." Jt. Exh. 4 at 12-54, 56; Jt. Exh. 3 at 13-100. Knapp concurred, emphasizing the need to be assured ". . . that the present conditions on the river will not be disturbed by the possibility of consumptive uses upstream." Jt. Exh. 4 at 12-54, 55. He pointed out that "The more consumptive use you build up upstream, the

less water will be present downstream from the same original water supply." *Id.* at 53-54. General Kramer put it more dramatically, noting that the Article permitted "new uses" but subject to ". . . keeping sacred the available water supply that is set up by the Compact." *Id.* at 17-37. Kansas interprets this emphasis on protecting the status quo as giving it a right to the amount of water used historically on approximately 70,000 acres of land that were irrigated by surface diversions and alluvial pumping developed as of 1948. Kan. Pre-trial Statement at 30.

The commissioners recognized the need to protect the supply flowing into Caddoa. In response to a question from one of the Bureau of Reclamation officials, Vidal said, ". . . it was our purpose to protect the situation with which we are dealing, namely the supply of the river at Caddoa, and a division and allocation thereof." Kan. Exh. 129, Vol. II at 365. Mendenhall, Kramer and Knapp also voiced the importance of protecting the flows into Caddoa. *Id.* at 364; Jt. Exh. 4 at 12-52, 53. Knapp described the water supply at Caddoa, together with the river gain below Caddoa at the Stateline, as the "basis of the apportionment in the Compact." Jt. Exh. 3 at 13-73. He said that Article IV-F (the forerunner of IV-D) would prevent depletion of that supply by "over-diversion." Jt. Exh. 3 at 13-101. Tate expressed the need to protect the present supply of water from depletion ". . . in anywise by some new developments or additional users." Jt. Exh. 4 at 12-102.

It is significant that the extensive record of compact negotiations does not reflect, at least insofar as I have been able to find, discussion of the extent of pumping that was then occurring in Colorado. The attention of the

compact commissioners was focused entirely on surface diversions by the various ditch companies. Protection of their supplies, limits on new ditches or diversions, limits on increased diversions – these were the issues. The engineering committee gathered and presented extensive data for the period 1908-42. These data included monthly streamflow measurements at nine stations along the river; monthly measurements of diversions in both Colorado and Kansas; transmountain imports; surface storage calculations including temperature, wind velocity, humidity, precipitation, and evaporation; and reservoir sedimentation studies. The committee's report specifically stated that irrigation supplies derived from pumping in both states were not included in the tabulated diversions. Jt. Exh. 5 at 3.

Current well pumping in Colorado appears simply not to have been a matter of concern to the compact commissioners. Had pumping been of any appreciable magnitude, I cannot believe that such use of water would not have surfaced in the engineering committee report and the compact negotiations. Absence of such discussion leads to the conclusion that pumping at that time was not large, a conclusion which is supported by other evidence in the case. Certainly, the compact commissioners did not foresee the technological breakthrough of the turbine pump and other conditions that led to the great increase in pumping which began in the 1950s. That is not to say that the compact language is not broad enough to cover depletions caused by pumping. I believe that it is, and that the intent of the commissioners was to protect against material depletions from any cause. However, during the compact negotiations the specific threat

appeared to be from future construction of dams and reservoirs, not from pumping.

The Kansas commissioners understood that under the compact and with the construction of John Martin Reservoir, Kansas was ". . . going to get a lesser supply of water, but with somewhat better usability." Jt. Exh. 4 at 17-33, 34. This was Knapp's comment at the final and seventeenth meeting of the commission after noting that Stateline flows over the 1908-42 period had averaged 280,000 acre-feet per year. Of course, this average included unusable flood flows. Comparisons of precompact and postcompact Stateline flows need to take these differences into account.

E. Article V on Apportionment.

A stated purpose of the compact is equitable apportionment of the waters of the Arkansas River, as well as the benefits arising from the construction, operation and maintenance of John Martin Reservoir. Article I-B. This goal is specifically addressed in Article V. Littlefield devoted a large part of Vol. II of his report to the negotiations leading up to this Article, which he described as "an immensely complicated task." Kan. Exh. 129, Vol. II at 392. However, the trial focused on Article IV-D, and the provisions of Article V warrant only a brief review.

The basic task undertaken by the commission in Article V was to determine what the existing division of river flows had been, and to develop a methodology for carrying that apportionment forward. Also the benefits of the new conservation in John Martin Reservoir had to be allocated. With respect to normal flows, the protection of

the status quo remained a dominant consideration. In Patterson's words, the important quantities of water were those that "heretofore have been diverted and appropriately used in the two states." *Id.* at 395-96. Historically, based upon the 1908-43 period, the ratio of diversions between the ditches in Water District 67 in Colorado (below John Martin) and those in Kansas was about 65/35.[40] Patterson, however, suggested that the future apportionment should be 60/40 in order to compensate Kansas for the increased use by ditches above John Martin. *Id.* at 420.

By the tenth meeting of the commission in September, 1947, the engineering committee had completed and submitted its report on basic water supply and use data, and the specific allocations in Article V began to emerge. The format of the apportionment was based upon the interim operating agreement negotiated by Mendenhall and Leavitt. Article V was essentially final by the fourteenth meeting in July, 1948, including an agreement that Kansas' share of normal streamflows would be measured at the Stateline rather than as inflow to the Reservoir, and that Stateline flows could be made up of return flows and other accretions to the stream occurring below John Martin.

Put succinctly, the final form of Article V provides that all winter flows into John Martin Reservoir (November 1 to March 31) will be stored, subject to Colorado's right to demand releases of 100 cfs. Summer flows (April

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[40] An average of 159,100 acre-feet annually in Water District 67 compared to 84,400 acre-feet in Kansas. *Id* at 420.

1 to October 31) are to be passed through the Reservoir up to flows of 750 cfs. The apportionment of these flows gives Colorado the right to releases from John Martin equivalent to river flow up to 500 cfs, and Kansas the right to that portion of river flow between 500 and 750 cfs. Summer inflow in excess of these releases is stored.

Stored water, whether conserved during the winter or summer months, is a common resource. Either state may demand releases of stored water "at any time during the summer storage period," provided that releases to Colorado shall not exceed the rate of 750 cfs and those to Kansas may not be greater than 500 cfs. If the conservation pool is less than 20,000 acre-feet, the release rates drop to 600 and 400 cfs, respectively. When there is water in the conservation pool, users upstream of John Martin are free from senior priorities in Water District 67. However, if the conservation pool is liable to be exhausted within fourteen days, Colorado must revert to administration of decreed priorities. Under those circumstances, Kansas is not entitled to any of the flows entering John Martin, although waters which may flow across the State-line are apportioned to Kansas. Ditch rights within Water District 67 and in Kansas may not be increased unless the compact administration finds that usable flows will not be materially depleted or adversely affected.

During the hearings on legislation to secure congressional consent to the compact, it was pointed out that the division of water was basically on a 60-40 ratio. Jt. Exh. 15 at 11, 15, 33. However, this was not intended as a rigid formula. Gail L. Ireland testified that either state might take more of the stored water "if the needs and conditions require it." *Id.* at 15. He said that the provisions

allowing both states to draw upon the pool of conserved water were inserted deliberately "in order to provide the water users with the very best possible use of this water at all times." *Id.* Hans Kramer described Article V as a "self-imposed rationing system." *Id.* at 33. General Kramer also pointed out that the compact precluded the allowance or accumulation of credits or debits due to variations from the 60-40 ratio, a provision which he called "boldly progressive." *Id.* All witnesses, for both states, expressed the same optimism that a half century of almost constant litigation was now fairly and finally settled. Clifford H. Stone, Director of the Colorado Water Conservation Board, called it a "red-letter day." *Id.* at 7.

Of course, since 1980 deliveries to Kansas and to the Colorado users in Water District 67 have been made pursuant to the 1980 Operating Plan rather than the provisions of Article V. The 1980 plan supersedes the "common pool" concept in John Martin Reservoir and establishes separate storage accounts for each state. Kansas takes the legal position that the compact administration lacked authority to adopt the 1980 plan. Yet Kansas acknowledges the benefits to both states that accrue from operating under the plan; Kansas has not exercised its option to cancel it; and Kansas makes no claim against the compact administration for the way in which it has administered the compact. Kan. Answer Br. at 52-53; RT Vol. 78 at 13.

In its Closing Brief re Kansas' Well Claim, Colorado quotes the testimony to Congress by George S. Knapp, the Kansas Chief Engineer and Chairman of the Kansas commissioners, to the effect that all the compact did was to convert floodwaters that otherwise would have gone to

waste into usable flows. Page 4. But that is not Knapp's full view of the compact. Indeed, in his report, also made part of the congressional hearing record, he specifically stated that the compact divided the "ordinary river flow" in addition to floodwaters made usable through the construction of John Martin Reservoir. Jt. Exh. 15 at 19.

Colorado states that the compact does not apportion the river on the basis of beneficial consumptive use, but rather "provides for a flexible and indeterminate apportionment based on the right of both States to make demands for releases from John Martin Reservoir." Colo. Closing Well Br. at 4. Of course, the compact also protects *inflow* into John Martin and divides, between the two states, the normal summer flow of the river, which must be passed through the Reservoir. Colorado's description of a "flexible and indeterminate apportionment" appears to come from a 1951 letter written by Hans Kramer to the Corps of Engineers. Colo. Exh. 57 at 2. In that letter Kramer describes the flexible philosophy as "Live and Let Live," which is also quoted by Colorado. Colo. Closing Well Br. at 5. However, it is clear that Kramer's remarks relate only to the conservation pool in John Martin and the ability of both states to draw upon it according to need.[41] Kramer's letter was not an effort to describe or summarize the entire compact.

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[41] The Arkansas River Compact contrasts sharply with the Pecos River Compact adopted by New Mexico and Texas at about the same time, namely, in 1948. The Pecos River Compact was based upon an Inflow-Outflow Manual which was to be used in determining flows into Texas according to particular levels of precipitation, and under consumption conditions prevailing in New Mexico in 1947. Despite this specificity, litigation developed when it became clear that the tables in the manual did not describe the actual state of the river, and that Texas was not receiving the flows originally intended. *Texas v. New Mexico*,

F. Conclusions about the Meaning of the Compact.

From all of the evidence in the case, and not merely from the summary and citations in this section of the Report, I have reached these conclusions about the meaning of the Arkansas River Compact:

1. The compact commissioners intended to and did effect an equitable apportionment of the waters of the Arkansas River.

2. The apportionment in the compact includes the normal flows of the river, as well as a division of the benefits associated with the conservation pool in John Martin Reservoir. Kansas is not limited merely to receiving its share of floodwaters conserved by John Martin Reservoir and which otherwise would have been unusable.

3. The apportionment was based upon conditions that existed at the time of the compact negotiations. The allocation of normal flows reflected generally the existing division of waters between the states and the uses that had been occurring. There was no intent to deprive existing users of water; and except as might be possible through increases in the usable supply, there was no intent to provide water for new irrigation.

4. The compact was intended to and does apply to all waters originating in the natural drainage basin of the Arkansas River and its tributaries upstream from the Stateline. This includes return flows from the use of such

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462 U.S. 554, 77 L.Ed.2d 1, 103 S.Ct. 2558 (1983); *Texas v. New Mexico*, 482 U.S. 124, 96 L.Ed.2d 105, 107 S.Ct. 2279 (1987).

water, and to tributary groundwater. Specifically, the compact applies to groundwater in the valley fill aquifer and in the bench or surficial aquifer, as described in the evidence.

5. Article IV-D allows future development of the Arkansas River basin in both Colorado and Kansas, provided that such development or construction does not materially deplete the usable flows of the river for use in either or both states. The compact is intended to protect such usable flows from material depletion caused by any increased consumptive use, including the construction of new wells or increased levels of pumping from precompact wells.

6. The term "materially depleted" in Article IV-D was meant to preclude complaints for trivial or inconsequential reductions in flow.

Additional conclusions about the intent of the compact are included later in the Report as part of the discussion of specific issues.

SECTION XI

COLORADO'S ADMINISTRATION OF GROUNDWATER PUMPING

Prior to 1965 Colorado had no administrative system for the regulation of groundwater pumping. Wells could be constructed and operated without regard to their impact on surface water users. Both the state engineer and the Attorney General of Colorado took the view that the state engineer did not have authority to curtail well production. Colo. Exhs. 365, 367, 368. The only exception, advised the Attorney General in 1964, was for wells "in the stream bed itself." Colo. Exh. 368. This remained his opinion, even though he stated that "We are all aware that tributary underground waters are a part of the natural streams of the watersheds in which they are situated, and are subject to the doctrine of appropriation under our State Constitution." Colo. Exh. 368.

The Colorado Supreme Court in *Fellhauer v. People*, 167 Colo. 320, 328-9, 447 P.2d 986, 990 (1968), quoted Benjamin Stapleton, Chairman of the Colorado Water Conservation Board, for a contrary view of the authority of the state engineer to regulate groundwater, but found it unnecessary to resolve the question. In any event, Colorado made no effort to regulate the pumping of groundwater tributary to the Arkansas River before 1965.

In 1957 Colorado had adopted legislation requiring permits for new wells, and calling for the registration of existing wells. The issuance of the permit, however, was ministerial. The state engineer could not withhold a well permit. RT Vol. 76 at 25, 106. The 1957 statute provided that:

> "Upon receipt of an application for a new, increased or additional supply of ground water from an area outside the boundaries of a tentatively critical ground water district . . . the State Engineer shall issue a 'permit to use ground water.' " Colo. Sess. Laws Ch. 289, § 5 (1957).

The Colorado system of laws and administration thus permitted a large number of wells to be drilled in the alluvium of the Arkansas River basin without consideration of their impact on vested surface rights, and indeed in the early years even without the knowledge of the state. According to evidence introduced by Colorado, some 1233 new large irrigation wells (i.e., those having a capacity of 100 or more gallons per minute) were drilled between 1949 and 1965. Colo. Exh. 165*, Table A.1. The Colorado evidence also shows 112 such wells allowed after 1965. Kansas inventoried wells over 50 gpm, and noted even a larger number of postcompact wells.[42]

A. Comparison Between Surface and Groundwater Control.

The lack of control over wells is in sharp contrast to Colorado's tightly administered system for the regulation of surface diversions. Colorado is an "appropriation" state. Article XVI, section 6 of the Colorado constitution provides, *inter alia*:

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[42] Kansas' evidence showed a total of 2,543 wells in 1985, and in the order of 850 in 1948. Colo. Exh. 851; Kan. Exh. 30, Table 2.

> "The right to divert the unappropriated waters of any natural stream to beneficial uses shall never be denied. Priority of appropriation shall give the better right as between those using the water for the same purpose."

As to surface diversions, Colorado thus follows the principle of "first in time, first in right." Indeed, that was the rule even before the state constitution was adopted. *Coffin v. Left Hand Ditch Co.*, 6 Colo. 443 (1882). Large-scale irrigation along the Arkansas River began in 1974 in the Rocky Ford area. Jt. Exh. 105 at 8. One of the senior rights to divert surface flows from the Arkansas River belongs to the Rocky Ford Ditch for 111.76 cfs, with a priority date of May 15, 1874. Kan. Exh. 19, 20.

The state is now divided into seven water divisions, corresponding to major surface drainage areas. Division 2 covers the Arkansas River, and that division in turn includes three water districts that embrace the mainstem of the river between Pueblo and the Stateline. Districts 14 and 17 lie upstream of John Martin, and District 67 covers the area from John Martin to the Stateline. Each water district is administered by a water commissioner who is an employee of the Division of Water Resources. These commissioners regulate the surface flow of the river in accord with the various rights and decrees.

In times of shortage, canals with junior water rights are curtailed in order to satisfy the demands of more senior rights. Because the river is over-appropriated, there is frequently a "call" on the river, that is, a limitation on diversions under junior rights in order to make water available to a canal with prior rights. RT Vol. 72 at 99-100. The call may move up and down the river "on an

hourly basis." RT Vol. 78 at 56. In 1984, the state engineer issued a water rights tabulation showing approximately 7,000 separate water rights along the Arkansas River, each with its own priority. Jt. Exh. 25.

River flows and diversions are now regulated through an extremely sophisticated satellite monitoring system. Most of the surface water gages have a continuous monitoring device associated with them, and streamflows from the various locations are relayed from the gaging stations to Denver by satellite. RT Vol. 67 at 117-18. There are some 80 data collection platforms in the Arkansas River basin, monitoring flows on the mainstem, on the tributaries, and at the major canals. *Id.* at 118. Data are collected at fifteen minute intervals, and are automatically relayed every four hours. However, Colorado officials can "dial in" and get data "as little as 15 minutes old." *Id.* at 120.

By way of contrast, Colorado does not generally require meters on wells, does not require any reports on the amount of water pumped, and does not have well pumping data along the Arkansas, except as prepared in connection with this case or for USGS or other reports. Indeed, one of the major factual issues during this trial has been the amount of water pumped, both in precompact and postcompact years. The location and distribution of pumping are also important for hydrologic modeling purposes. Both states have made enormous efforts under difficult and sometimes virtually impossible circumstances to collect or to create the required pumping data. But even so, reproducing conditions since 1950

cannot be done with certainty. Obviously Colorado's well data base could stand improvement.[43]

B. The Increases in Groundwater Pumping.

Pumping from groundwater tributary to the Arkansas River was not significant in the precompact years. Dr. Jeris Danielson, who was then the state engineer and head of the Colorado Division of Water

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[43] Both the former and present state engineers testified that requiring meters on wells was not feasible. Dr. Jeris Danielson, who was then the state engineer, testified that requiring meters on some 1,600 wells spread over thousands of square miles does not mean that the state would get compliance or accurate records. "I have seen many instances where a meter never works on a well. It is always broken. It is vandalized. It has sand in the mechanism. It just will not work." RT Vol. 77 at 126. Dr. Danielson said, "I can't lock up 1,600 well owners in the Pueblo County jail because they refuse to have a meter that works. So you have to look at another way to skin the cat." RT Vol. 77 at 127. His policy was to require meters on replacement well permits. He concluded that "Ultimately, we'll have a meter on every well." RT Vol. 77 at 128. Hal Simpson, the current state engineer, testified earlier in his capacity as deputy state engineer. He emphasized the physical difficulty of maintaining flow meters in older wells. He said they pump sand and "wear out very fast." RT Vol. 67 at 116. For this trial, both states estimated pumping through the use of power records and pump efficiency tests. However, none of these data sources, particularly during the earlier years, was what engineers would like to have. For the future, it would seem that at least the factual basis required to estimate pumping through this methodology could be strengthened. Hal Simpson testified that he is now requiring the two major well organizations in the Arkansas Valley to measure power consumption coefficients and estimate pumping based on power records. RT Vol. 130 at 52-53.

Resources, testified that wells "weren't relied upon generally." RT Vol. 76 at 35. Although Colorado had no records during the 1940s of the number of wells or amounts of water pumped, later studies attempted to create these data. A 1968 report prepared pursuant to Colorado Senate Bill 407 put the pumping in 1940 at only 2,300 acre-feet. Jt. Exh. 92 at 22.[44] The report shows a gradual increase in pumping during the 1940s, reaching 23,000 acre-feet in 1949. *Id.* at 22. Similar figures were published by the Colorado state engineer in a 1975 report prepared for the trial on the amendment to the 1973 Rules in the case of *Kuiper v. Atchison, Topeka & Santa Fe Ry. Co.*, 195 Colo. 557, 581 P.2d 293 (1978). Jt. Exh. 94 at 22; RT Vol. 77 at 35-36. By way of contrast, diversions by the various ditch companies between Pueblo and the Stateline averaged approximately 857,000 acre-feet annually during the precompact years of 1908-1942. Jt. Exh. 5 at 20.

The "big surge" in well development along the Arkansas River came in the 1950s and early 1960s. RT Vol. 76 at 102. Danielson attributed this rapid increase to an improvement in technology, namely, the vertical turbine pump, and to the availability of inexpensive electrical power. RT Vol. 76 at 102; Kan. Exh. 514, Vol. I at 210. Precompact pumping had been accomplished primarily by centrifugal lift pumps, sometimes powered by tractors. RT Vol. 76 at 102. The Water Court in the trial on the

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[44] The Colorado evidence prepared for this trial claimed that the 1940 pumping amounted to 36,837 acre-feet. The approach used by Colorado to reach this larger figure will be discussed later.

state engineer's amendment to his 1973 Rules described the use and value of groundwater in one of its findings:

> "The evidence is uncontroverted that irrigation wells are now used where available to overlying owners to supplement surface decrees when surface supplies are short. Thus, wells are pumped in the spring before the runoff begins in order to start crops. Without supplemental groundwater in the spring, seed loss may be experienced from lack of soil moisture necessary for germination. Wells are also pumped in the late summer and fall when surface water supplies are not adequate to 'finish' crops and lack of well water at this time reduces crop yields. Such a regimen of conjunctive use of well and River water has developed uniformly throughout the Arkansas Basin over a substantial time period, and now appears to have the acquiescence if not the support of a substantial part of the irrigation economy in the basin . . . The use of wells in the Arkansas Valley has made water available in the early spring and late summer and fall periods when water is needed for irrigation but would not otherwise be available from surface diversions." Jt. Exh. 157 at 10.

While pumping data are in dispute, both states showed large increases in pumping between 1950, the first postcompact year, and 1964, the last year before efforts by Colorado to regulate pumping. Colorado estimated pumping in 1950 from Pueblo to the Stateline at 41,458 acre-feet. In 1964 Colorado shows that pumping had risen to 203,925 acre-feet. Colo. Exh. 165*, Table A.1. The comparable Kansas figures are 31,201 acre-feet for 1950, and 220,079 acre-feet for 1964. Colo. Exh. 852.

The consumptive use of well water through transpiration and evaporation varies with many factors – the type of crop, the location, method of irrigation, water application rate, and various climate and soil conditions. Along the Arkansas River in Colorado, average consumptive use figures ranging between 60% and 80% have been used in various historic documents. Colo. Exh. 386 at 275; Jt. Exh. 92 at ii. Most of the reports, however, fall between 70% and 80%. Jt. Exh. 78; Jt. Exh. 91 at 11. The State of Colorado itself, in a report done in 1975, estimated consumptive use at 75%, with the remainder of the applied water returning to the stream system. Jt. Exh. 94 at 51.

Whatever the specific percentage may be, however, it is clear that additional pumping in Colorado, absent an offset in surface diversions, increases the consumptive use of water in Colorado and ultimately decreases the surface flows of the Arkansas River.

Danielson testified that the damage done to surface flows "is very closely related to the consumptive use of the well water that is withdrawn from the alluvium." RT Vol. 77 at 34, 37-38. In the 1975 trial of *Kuiper v. Atchison, Topeka & Santa Fe Ry. Co.*, on the Amendment to the 1973 Rules, Danielson who was then the deputy state engineer testified to the same effect, namely, that the consumptive use of well water can be shown as a decrease in river flows. In that case, he estimated that such consumptive use averaged about 112,800 acre-feet per year in the period 1965 through 1972, plus phreatophyte losses. Kan. Exh. 514, Vol. I at 232. See also Jt. Exh. 92 at ii, vi; Jt. Exh. 94 at 1, 53. However, under examination by Colorado's counsel during this trial, he said that the river loss which he quantified occurred in the whole reach from Pueblo to

the Stateline. It would not in his opinion translate into a reduction at the Stateline. He did not make a Stateline determination. RT Vol. 78 at 85.

C. Colorado's First Efforts to Regulate Pumping.

The pressure to regulate groundwater pumping in Colorado, which resulted in the 1965 legislation, came not from Kansas but from holders of surface rights in Colorado. One commentator states that matters came to a head when a number of the canal companies in the Arkansas Valley filed a petition with the state engineer demanding that he curtail well diversions, and their petition was dismissed for lack of jurisdiction.[45] However, another commentator indicates that it was a "crisis" situation in the state as a whole. He states that in 1964 alone some 5,911 new wells were constructed.[46] In any event, the 1965 Act succinctly directed the state engineer to administer the distribution of surface waters, "including the underground waters tributary thereto" in accordance with the right of priority of appropriation. Colo. Exh. 378, C.R.S. § 148-11-22. The state engineer was also authorized to apply to the courts for an injunction to prevent well diversions "from materially injuring the vested rights of other appropriators." *Id.*

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[45] "Integrating Ground and Surface Water Use in an Appropriation State," 20 Rocky Mountain Min. L. Inst. 691 at 697 (1975).

[46] "Appropriation and Colorado's Ground Water: a Continuing Dilemma?" 40 Univ. Colo. Law Rev. 133 (1967), also quoted in "A Survey of Colorado Water Law," 47 Denver Law Journal 226 at 324 (1970).

The state engineer's first attempt to enforce this legislation was set aside by the Colorado Supreme Court. The division engineer ordered that 39 wells along the Arkansas River cease pumping, although he testified that all of the large irrigation wells, more than 1,600 of them, affected river flows. *Fellhauer v. People*, 167 Colo. 320, 447 P.2d 986 at 992-93 (1968). The division engineer added that he didn't want to shut down all of the wells, "because you are going to affect the economy of the valley." *Id.* Under these circumstances, the Colorado Supreme Court, sitting *en banc*, easily found that the action of the state engineer's office was discriminatory, and in violation of the equal protection clause of the federal constitution and the due process clause of the Colorado constitution. *Id.* at 993.

However, going far beyond what was required to decide the case before it, the Supreme Court set forth three "requirements" for any future valid regulation of wells under the 1965 Act. Pertinent here is the statement that there must be only a "reasonable lessening" of material injury to senior rights. *Id.* at 993. This appears to be a more lenient standard than the act itself, which calls for an injunction when necessary "to prevent" material injury. The "reasonable lessening" test is tied to another pronouncement of the Court. The Court stated that, along with the protection of vested rights, "there shall be *maximum utilization* of the water of this state." *Id.* at 994, emphasis in original. The "new drama" of the next century, said the Court, would be how the doctrine of maximum utilization could be constitutionally integrated into the law of vested rights. *Id.* at 994.

Notwithstanding the Court's rebuff of his efforts to regulate pumping from existing wells, the state engineer essentially refused after 1965 to issue permits for new alluvial wells along the Arkansas River between Pueblo and John Martin Reservoir. RT Vol. 130 at 115-16. This portion of the river was described by Colorado throughout the trial as Reach 3. However, the state engineer did not follow the same policy in the river reach between John Martin and the Stateline, a distance of about 58 miles. Colorado designated this area as Reach 4, and its tabulation of wells shows that 90 new wells were allowed in Reach 4 between 1965 and 1985. Colo. Exh. 165*, Table A.1. Danielson testified that as state engineer he did not issue any well permits after 1979, either upstream or downstream of John Martin, because there was "no unappropriated ground water left." RT Vol. 76 at 115, 110.

D. The 1967-68 Studies.

In 1967 the Colorado General Assembly adopted Senate Bill 407, "providing for a study of water resources, water uses, and the administration of applicable water laws." Colo. Exh. 380. The legislative charge was to investigate relationships in the areas where intermingled surface and groundwater were commonly used in conjunction with each other, and to determine the need for and content of legislation that would provide for the integrated administration of all diversions and uses of water. The directions further called for the protection of all vested rights, along with the "full utilization of all waters in the state." *Id.*, Section 1(b). The study of the Arkansas River that resulted from that legislation was the basis of a 1968 report prepared by W. W. Wheeler and

Associates, and Woodward-Clyde & Associates, hereafter referred to as the "Wheeler Report." Jt. Exh. 92.

The Wheeler Report states that drafts were reviewed by the Colorado state engineer, the Colorado Water Conservation Board, and the U. S. Geological Survey. The report concludes, *inter alia*:

> (a) That the limited and variable flows of the Arkansas River are generally inadequate to fully supply the irrigation water requirements of the basin.
>
> (b) *That the use of wells in recent years has materially decreased the surface flows available to direct flow and storage rights.* (Emphasis added)
>
> (c) That groundwater in the alluvium between Pueblo and the Stateline amounts to about 1,600,000 acre-feet, of which about 460,000 acre-feet are theoretically useable. Jt. Exh. 92 at v and vi.

The report also recommended that recorders be installed on all wells, and that accurate and continuous discharge records be obtained of major tributary inflow. *Id.* at vii. Neither of these recommendations was implemented, although some tributary streamflow gages were installed.

E. The 1969 Act.

The next legislative effort attempting to reconcile the competition between wells and surface rights was the "Water Right Determination and Administration Act of

1969." Colo. Exh. 385; C.R.S. § 148-21-1, *et seq.*[47] This act made significant changes in Colorado water law, establishing the seven new water divisions, setting up a system of Water Courts, requiring a statewide tabulation of water rights, and initiating numerous other administrative procedures. For purposes of this action, however, the importance of the act lies in its declaration of policy and in its provisions relating to wells.

The legislature declared it to be the state policy of Colorado ". . . to integrate the appropriation, use and administration of underground water tributary to a stream with the use of surface water, in such a way as to maximize the beneficial use of all of the waters of this state." § 148-21-2(1). The act further declared ". . . that the use of underground waters as an independent source or in conjunction with surface waters is necessary to the present and future welfare of the people of this state." § 148-21-2(2). The legislature directed that "the existing use of groundwater, either independently or in conjunction with surface rights, shall be recognized to the fullest extent possible, subject to the preservation of other existing vested rights." § 148-21-2(2)(b). The act provided that groundwater could also be considered as an alternate or supplemental source of supply for surface decrees previously entered.

Groundwater rights were brought into the adjudication system. Applications for groundwater rights filed by July 1, 1971 were permitted to obtain a priority date

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[47] "Few proposals have undergone such extensive and heated debate as the 1969 water bills." The Groundwater-Surface Water Conflict, 43 Univ. of Colo. Law Rev. 1, 24 (1971).

corresponding to the date of actual appropriation. § 148-21-22. State water officials were directed to administer ground and surface waters together in accordance with their priorities, but diversions were not to be curtailed unless they would cause "material injury" to water rights with senior priorities. § 148-21-35.

The references to conjunctive use and maximizing the use of all of the waters in the state coincide with the conclusions of the 1968 Wheeler Report. That report pointed to 1.6 million acre-feet of groundwater in the alluvium between Pueblo and the Stateline, of which 460,000 acre-feet were said to be "theoretically useable."[48] Jt. Exh. 92 at vi. The report concluded that "The best utilization of the basin's water resources would be through the integrated or conjunctive use of wells, the storage of winter flows and excessive diversions, and the delivery of water in phase with crop requirements." *Id.*

Obviously, the policies and directions enunciated by this act did little to resolve the inherent conflicts between a priority system for surface diversions that had been fully developed before the turn of the century, and the much later use of wells pumping tributary groundwater. The dilemma was softened, perhaps, only by the fact that well owners and surface rights holders were not distinct groups pitted against each other. Most owners of surface

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[48] The Colorado Supreme Court later used an estimate of 2.0 million acre-feet of groundwater in the alluvium. *Kuiper v. Atchison, Topeka & Santa Fe Ry. Co.*, 195 Colo. 557, 581 P.2d 293 (1978). The USGS also used 2.0 million acre-feet in a 1970 report. Jt. Exh. 66 at 2.

rights also benefitted from wells. *Kuiper v. Atchison, Topeka & Santa Fe Ry. Co.*, 195 Colo. 557, 581 P.2d 293 (1978).

F. The 1971 Kuiper Decision.

Meanwhile, the state engineer was proceeding to develop rules and regulations as required by the *Fellhauer* decision. The regulations, as promulgated, were applicable to the South Platte and Arkansas Rivers for only the limited period of August 8 to October 15, 1969. Colo. Exh. 383. They reflected the requirement in *Fellhauer*, that the regulations effect a "reasonable lessening" of material injury, rather than the prevention of such injury. The policies under which the rules were promulgated included the statement:

> "Every effort is made to utilize the water found in the alluvium which water is hydraulically connected to the surface channel of the streams of the state." *Id.* at 2.

Moreover, the policies declared that the existing use of groundwater, either independently or in conjunction with surface rights, "shall be recognized to the fullest extent possible, subject to the preservation of other existing vested rights." *Id.*

The regulations were designed, they stated, to accomplish three main purposes: to protect vested rights, to preserve the economy that had been established through the use of wells "to the fullest extent possible," and to obtain maximum possible utilization of the waters of the state. *Id.*

The regulations grouped wells into three zones according to the time that would elapse between the commencement of pumping and their effect upon the surface stream. The regulations were to be implemented only upon the written demand of a senior surface appropriator and, in no event were wells to be curtailed more than three days per week. *Id.* at 6.

A group of well owners in the South Platte Basin promptly attacked the regulations and were able to obtain a permanent injunction from the trial court. On appeal, the Colorado Supreme Court, sitting *en banc*, overturned the trial court, rejecting the various objections to the regulations, finding that they were consistent with the requirements of the *Fellhauer* decision and of the 1969 Act, and that they represented a reasonable attempt to achieve the goal of maximum utilization. *Kuiper v. Well Owners Conservation Ass'n*, 176 Colo. 119, 490 P.2d 268 (1971).

In this decision, the Colorado Supreme Court reinforced its earlier policy pronouncements:

> "In *Fellhauer*, we attempted to sound the note of a new era in the utilization and optimal use of water. It appears to us that the General Assembly reacted favorably to that attempt and in turn sought to promote in detail the general thought of *Fellhauer*. We have the same view of the acts of the State Engineer. We suggest that there is a slight indication of a feeling upon the part of the plaintiffs and on the part of the trial court that changes should not be required in the operation of wells on the Platte River. There must be

change, and courts, legislators, the State Engineer and users must recognize it." 490 P.2d 268 at 283 (1971); Colo. Exh. 386.

G. The 1973 Rules.

Continuing to wrestle with the competing concepts of maximizing the use of ground and surface rights while still protecting the priority system, the state engineer issued new rules and regulations in 1972. RT Vol. 76 at 110-11; Jt. Exh. 93. These rules became effective on February 19, 1973, and today are still the rules and regulations which regulate pumping on the Arkansas River. RT Vol. 76 at 19-20; Jt. Exh. 157 at 5-6. They are quite simple. They limit pumping to three days a week, unless the division engineer approves a written plan whereby "the amount of the depletion from the stream by said well or wells will be returned to the stream so that prior vested rights are not damaged." Jt. Exh. 93 at 2. The rules are intended to provide for a "reasonable lessening of material injury, whether present or future, to senior appropriators." *Id.* No protests to these rules were filed. Jt. Exh. 157 at 6.

Dr. Danielson, then state engineer for the State of Colorado, was called by Kansas as a hostile witness during the trial of this case. He acknowledged that the 1973 rules and regulations have not, in fact, reduced pumping below the 1973 levels. Indeed, pumping increased. RT Vol. 76 at 30-31. According to Colorado's own pumping data, well pumping in 1973 amounted to 128,354 acre-feet. Yet pumping in the highest subsequent year, 1976, reached 285,887 acre-feet. In no year through 1985 was the pumping less than the 1973 level. Colo. Exh. 165*, Table A.1.

While Danielson testified that the 1973 rules were intended to "protect existing wells, not to allow expansion," the state engineer at that time (C. J. Kuiper) continued to permit new wells in the area downstream from John Martin. RT Vol. 77 at 118; RT Vol. 76 at 112-15; RT Vol. 130 at 63-64. This was particularly true in the area below the Buffalo Canal headgate, that is, downstream from the last surface diversion in Colorado, and close to the Stateline. In its closing brief, Colorado states that it "does not dispute that wells drilled east of the Buffalo Canal headgate after 1965 depleted Stateline flows to some extent during the 1970s." Colo. Closing Well Br. at 19; RT Vol. 115 at 62. However, Colorado maintains that such depletions have been offset by the 1980 Operating Plan for John Martin Reservoir.

H. Amendment to 1973 Rules.

On January 4, 1974 the state engineer attempted to tighten the 1973 regulations. He proposed an Amended Rule 3 to be effective March 27, 1974. The amendment provided for pumping curtailment of five days per week during 1974, six days during 1975, and total curtailment in 1976. *Kuiper v. Atchison, Topeka & Santa Fe Ry. Co.*, 195 Colo. 557, 581 P.2d 293 (1978); Colo. Exh. 387. The shutdown provisions, however, under both the amendment and the 1973 rules, did not apply to wells operated as alternate points of diversion for surface rights in priority, or wells that were embraced within augmentation plans approved by the state engineer. *Id.* at 296.

Numerous protests were filed to the amended rule. These were consolidated for trial in the Water Court,

which disapproved Amended Rule 3, but decreed that the 1973 rules should otherwise remain in effect, thus allowing all wells to continue to pump at least three days a week. The state engineer appealed. The Colorado Supreme Court, sitting *en banc*, affirmed the position of the Water Court. *Id.* at 294.

I. State Engineer's 1975 Report.

In preparation for the Water Court trial on the amendment to the 1973 rules, the Colorado state engineer prepared a report entitled "Stream Depletion by Wells in the Arkansas River Basin – Colorado, March, 1975." Jt. Exh. 94; RT Vol. 76 at 86-87. The study and report were done under the supervision of Dr. Danielson, who was then the deputy state engineer.[49] Dr. Danielson testified that he was personally involved in this work, and the report became a principal exhibit in the trial before the Water Court. RT Vol. 76 at 88, 94; RT Vol. 77 at 35-36.

This 1975 report is significant here also. The state engineer's investigation was undertaken:

> ". . . for the purpose of determining if the pumping of alluvial wells is significantly depleting the Arkansas River and thus causing material injury to senior surface water appropriators.

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[49] Dr. Danielson joined the state engineer's office in 1970 as chief of planning and was appointed state engineer in 1979. Colorado characterized him as a "highly qualified expert in his own right, with a doctorate in civil engineering from Colorado State University, with emphasis in water resources, fluid dynamics, and hydrology." Colo. Closing Well Br. at 151. His full qualifications are found in Kansas Exhibit 634.

> More specifically, the objective of this report is to quantitatively evaluate the effects of wells on stream flows, diversions, and river gain (or loss) in the reach of the Arkansas River between Canon City and the State line." Jt. Exh. 94 at 2.

The report concluded:

> "The rapid growth of high-capacity irrigation wells tapping the alluvial aquifer of the Arkansas River Valley in southeastern Colorado during the late 1940's, 1950's and early 1960's has decreased the amount of river water available for surface water appropriators." Jt. Exh. 94 at 1.

Danielson testified at the trial that he still agreed with that statement. RT Vol. 76 at 88.

The report also states, "The increasing use of ground water for irrigation in the Arkansas River basin since 1950 has affected stream flows in such a way as to deprive senior water users of a portion of their lawful water supply." Jt. Exh. 94 at 53. According to the report, "excessive pumping" from the Arkansas River alluvium has caused a "decrease in stream flows below Canon City." *Id.* at 53. Danielson testified during the trial here that he still agreed also with that conclusion. RT Vol. 78 at 85.

For the period 1965-72, the report states that the reduction in return flows between Canon City and the Stateline, and the decrease in diversions, averaged 112,800 acre-feet per year, which was "equivalent to the consumptive use of well water" and phreatophytic losses.

Jt. Exh. 94 at 53. Considering the data now available, Danielson testified that the 112,800 acre-foot figure might be a "bit high," but "does not appear outlandish." RT Vol. 78 at 87. However, he cautioned that it does not translate directly into Stateline depletions. That report did not consider possible offsets to the impact of groundwater pumping on Stateline flows, such as transmountain return flows, or forced reductions in surface diversions in Colorado that might cushion the impact at the Stateline.

The importance of this report is underscored by a 1987 letter from Myron B. Fiering, one of Colorado's most distinguished experts, written to another member of the Colorado trial team.[50] Dr. Fiering wrote:

> "The 1975 Danielson Report – *the one we all wish had never been written* – has a basin model whose complexity is, in my view, just about right. . . . The only problem I have with the Danielson Report is that *its unhappy conclusion might be unassailable* without a more detailed model – and a more detailed model implies more parameters and more equations, all of which render the results more subject to error . . . a real Hobson's choice!" Kan. Exh. 674 at 3. (Emphasis added).

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[50] Dr. Fiering, now deceased, was one of the most distinguished scientists in America. At the time of his testimony he was the Gordon McKay Professor of Engineering and Applied Mathematics at Harvard University, having been a member of the Harvard faculty since 1961. RT Vol. 109 at 99. His exceptional curriculum vitae is found in Colorado Exhibit 665. Dr. Fiering was one of the experts assembled by Colorado to advise the state in the development of its water budget analysis.

J. The Colorado Supreme Court Decision on Amended Rule 3.

In its opinion on the Amended Rule 3, the Colorado Supreme Court noted evidence before the Water Court that well pumping in 1972 exceeded 200,000 acre-feet; and that an estimated 2 million acre-feet of water is generally held in transient storage within the river alluvium. *Kuiper v. Atchison, Topeka & Santa Fe Ry. Co.*, 195 Colo. 557, 581 P.2d 293 (1978). The Court pointed out, however, that a restriction of well pumping does not necessarily result in a comparable increase in the supply of surface water. The Court cited many factors that can offset or modify the depletive use of well water: changes in groundwater storage; reduction in phreatophytic losses resulting from lowering the groundwater table; increased irrigation efficiencies; and variations in the amount of river flow. But in the final analysis the Supreme Court struck down the amendment because it did not rest upon real operating experience and an evaluation of operations under the 1973 rules. 581 P.2d at 297.

The Water Court had found that there was no evidence that the amendment "was required to prevent material injury to vested senior rights at the time of a senior need." *Id.* at 296. The Supreme Court approved this ruling. It also characterized the amendment as a "drastic change," that under the circumstances was in conflict with legislative policy that:

> "Ground water diversions shall not be curtailed nor required to replace water withdrawn, for the benefit of surface right priorities, even though such surface right priorities be senior in priority date, when, assuming the absence of ground

> water withdrawal by junior priorities, water would not have been available for diversion by such surface right under the priority system." *Id.* at 296-97.

In short, the Supreme Court found that there was a duty upon the state engineer, before adopting the amendment, to determine that it would make additional water available for senior priorities, when needed. He did not do this, and could not do so, said the Court, because he did not yet know the effects of the 1973 rules. *Id.* at 297. Although the Court's decision was made in 1978, there has been no subsequent effort to amend the 1973 rules, which remain in effect today as the regulations for the control of groundwater pumping.

K. Policies Affecting the 1973 Rules.

Danielson and Simpson testified extensively about the policies that went into the formulation and administration of the 1973 rules.

> (a) To begin with, they understood that a strict administration of the priority system "would result in shut-off of nearly every well that existed in the state." RT Vol. 76 at 25-26. The state engineer's office did not believe that the legislature intended it to "go out and put them all out of business." RT Vol. 76 at 37, 34.
>
> (b) The state engineer's office also recognized the economic importance of preserving well pumping. Danielson testified that if the appropriation system were strictly implemented it would "bankrupt the eastern third of the state of Colorado." RT Vol. 76 at 39. The thrust of the state engineer was "not to go out and destroy

the economy." *Id.* at 26. "The idea was to save those wells, keep that economy alive." RT Vol. 77 at 64.

(c) Colorado faced a "very delicate balancing act," that is, to maximize use and still adhere to the priority system. *Id.* The approach chosen by the legislature, according to the state engineer, was "the maximum utilization concept, consistent with the priority system. RT Vol. 76 at 39. The state engineer saw the provisions of the 1969 Act regarding maximizing use as a "mandate." RT Vol. 77 at 35.

(d) Maximum use was sought through the use of groundwater and the alluvial groundwater storage capacity. *Id.* at 34-35. In turn, this meant employing the "reasonable lessening of injury" test for the protection of prior vested rights. RT Vol. 76 at 26, 29, 33. This is the test enunciated by the Supreme Court in the *Fellhauer* case, as opposed to the prevention of material injury. *Fellhauer*, 447 P.2d 986 at 993.

(e) The approach of curtailing pumping no more than four days a week had no "scientific basis," but rather was an "arbitrary approach" that was easily understood and administered. RT Vol. 76 at 28-29. However, at the time the state engineer believed that the four-sevenths curtailment provided a reasonable lessening of injury, and would give well owners an incentive to take advantage of the other aspects of the 1969 Act, namely, exchanges, substitute supply plans, and plans for augmentation. *Id.* at 26, 39.

In addition to the statutory and quasi-judicial duties that have been discussed, the state engineer since 1969

has been charged with the specific responsibility of making and enforcing such regulations as may be necessary to enable Colorado to meet its compact commitments. C.R.S. 1963, § 148-11-24, now C.R.S. § 37-80-104, 15 C.R.S. provides:

> "The state engineer shall make and enforce such regulations with respect to deliveries of water as will enable the state of Colorado to meet its compact commitments. In those cases where the compact is deficient in establishing standards for administration within Colorado to provide for meeting its terms, the state engineer shall make such regulations as will be legal and equitable to regulate distribution among the appropriators within Colorado obligated to curtail diversions to meet compact commitments, so as to restore lawful use conditions as they were before the effective date of the compact insofar as possible."

Dr. Danielson testified that the 1973 rules were not promulgated under this provision of the law. He said, "They are not intended to establish standards for administration within Colorado to meet terms of the Arkansas Compact, no. They are intended to govern the appropriation of groundwater in the Arkansas Valley." RT Vol. 76 at 85. Nor have rules to ensure compliance with the compact ever been prepared for the Arkansas River. He testified that it had not been done ". . . because it was never determined necessary to define an intrastate administrative scheme to meet that obligation." *Id.* at 86.

I have seen little in the extensive record of Colorado legislation, studies, reports, regulations and judicial decisions of this time affecting flows in the Arkansas River that appears to recognize Kansas' compact interest.

L. Augmentation Plans Under the 1973 Rules.

The 1969 Act provides for plans of augmentation, which were defined as follows:

> ". . . a detailed program to increase the supply of water available for beneficial use in a division or portion thereof by the development of new or alternate means or points of diversion, by a pooling of water resources, by water exchange projects, by providing substitute supplies of water, by the development of new sources of water or by any other appropriate means." Colo. Exh. 385 at 1202.

Based upon that legislative authority, the 1973 rules of the state engineer provide for an exemption from the four-sevenths curtailment. The rules require a written plan approved by the division engineer ". . . whereby the amount of the depletion from the stream by said well or wells will be returned to the stream so that prior vested rights are not damaged." Jt. Exh. 93 at 2. Under these circumstances, wells that are included in such an approved plan are exempt from any pumping curtailment. RT Vol. 77 at 110; Kan. Exh. 40, Doc. 59 at 2.

In Water District 67, which includes the area between John Martin Reservoir and the Stateline, the ditch companies organized a group known as the Lower Arkansas Water Management Association. RT Vol. 76 at 49. This

association, referred to generally as LAWMA, included on the order of 300 to 350 wells. *Id.* at 80.[51] The purpose of LAWMA was to develop a plan that would permit those wells to pump without restriction. RT Vol. 77 at 54.

Ultimately, with assistance from the state, the local association developed the Buffalo Canal Demonstration Project. Kan. Exh. 40, Docs. 15, 19, 24, 29, 49, 59. The project called for constructing eight wells along the Arkansas River, downstream from the headgate of the Buffalo Canal, having a capacity of not less than 25 cfs. *Id.* This water was then to be pumped into the Buffalo Canal and laterals to help offset depletions in the surface flows of the Arkansas River. RT Vol. 76 at 111-12; RT Vol. 77 at 110. These depletions were caused by "wells owned by Association members." Kan. Exh. 40, Doc. 59 at 1. Thus, the project did nothing more than use groundwater pumped from new wells downstream to help offset stream depletions caused by older wells upstream. RT Vol. 76 at 135; RT Vol. 16 at 77-78. Yet this project was approved by the state engineer as a "substitute supply" plan under the 1969 Act. RT Vol. 77 at 50-52.

The stated purpose of the project was to utilize "the unappropriated ground water below the Buffalo Canal headgate." Kan. Exh. 40, Doc. 59 at 1. It provided "much needed irrigation water" during the unusually dry period of 1974-78. *Id.* at 2. Moreover, association members were permitted "to pump unrestricted throughout the irrigation season." *Id.* According to the state engineer, the

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[51] Other testimony put the number of wells at about 400, or about 80% of the total downstream from John Martin Reservoir. RT Vol. 77 at 57.

benefits of this "management plan" were considerable "since so much of the economy is dependent upon irrigation water from alluvial wells." *Id.*

The eight demonstration project wells were located in the sixteen-mile reach between the last Colorado surface diversion and the Stateline. Only Kansas users could be affected by this pumping, but the impact on Stateline flows "was never a consideration." RT Vol. 77 at 83. The only constraints contemplated were those imposed by "economics and hydrogeology." Kan. Exh. 40, Doc. 11. Moreover, in this general area there were 50 to 60 post-1972 wells permitted by the state engineer. RT Vol. 76 at 127. Under the 1973 Rules, these wells would not have been allowed to pump even three days a week unless they were included in an augmentation plan. *Id.* at 126-127. Thus, LAWMA freed even these wells from restrictions if they were operated by members of that association.

Moreover, by substituting groundwater for surface flows, the Buffalo Canal, which holds a very senior right, freed up surface water for diversion by junior ditches upstream. RT Vol. 77 at 61. The LAWMA "augmentation" project thus added to the consumptive use of water in Colorado, but not to the common supply of the Arkansas River and its tributary groundwaters.

The eight demonstration project wells went into operation between 1975 and 1978, but ceased to operate in 1983. *Id.* at 102. In more recent times, LAWMA has begun to lease stored water in John Martin, and has purchased outright one small 6.5 cfs surface diversion right. *Id.* at 105-06. While this direction appears to be

more in line with the intent of the 1969 Act, no evidence was presented on the specific amounts of water involved.

In the area upstream from John Martin, another association has been formed, called Colorado Water Protective and Development Association. Like LAWMA, its purpose is to provide an augmentation plan that will protect its members from well curtailment. RT Vol. 78 at 25-26. Membership in this association is in the order of 700 to 800 members. RT Vol. 76 at 50; RT Vol. 78 at 45. This association has been making yearly arrangements with the division engineer to purchase limited amounts of "return flow" from transmountain imports. RT Vol. 78 at 26-29. However, the amounts appear small. Generally, they have been in the order of 10,000 acre-feet or less. RT Vol. 16 at 65.

A 1981 example shows that the members would need 18,764 acre-feet of groundwater to meet their full crop demands. RT Vol. 78 at 47. After various calculations, the report submitted to the division engineer concludes that the replacement requirement should be only 2,742 acre-feet. *Id.* at 48.

According to Colorado data, total pumping in Reach 3 in 1981 was approximately 133,000 acre-feet. Yet water provided for augmentation was only in the order of 7000 acre-feet. *Id.* at 61. Danielson acknowledged that 7000 acre-feet would not offset the streamflow depletions arising from some 133,000 acre-feet of pumping, but he pointed out that the 133,000 figure is a total for all wells in Reach 3, not merely those within the association. In any event, Danielson testified that there was not a "one

for one" replacement, but that he thought the replacement requirement was adequate under the rules and regulations. *Id.* at 53. He testified that the state engineer continually urges the association members "to be more sophisticated and to obtain more assets as they are able." *Id.* at 53.

The evidence showed that at least as late as 1983 the association had not developed and sought approval of a permanent plan of augmentation, although urged to do so by the division engineer. Kan. Exh. 41, Docs. 33, 35; RT Vol. 16 at 69. Rather, it operated on the basis of one-page annual letters simply listing the sources and sometimes the amounts of water to be obtained. In 1982, for example, it listed 1500 acre-feet of return flow from the Southeastern Water Conservancy District; 500 acre-feet of purchased transmountain water; the return flow from 5794.32 shares of Twin Lakes water; and the return flow from approximately 4000 acre-feet imported by the High Line Canal Co. Kan. Exh. 41, Doc. 25. The latter two sources did not indicate the amount of the actual return flow. Nor does it appear that the amount of the well depletions being addressed was ever calculated. RT Vol. 16 at 70-73; Kan. Exh. 41.

The division engineer sought more detail in the place, time, rate and amount of return to the Arkansas River for each of these sources, but the reply was as skimpy as the original data. Kan. Exh. 41, Docs. 26, 27. Some of these sources were also found later to be unacceptable by the division engineer because other users already held vested rights to the return flows. *Id.*, Docs. 34, 35. Nonetheless, it appears that these meager annual arrangements permitted all 700 or so members of the

association to pump without limit seven days a week. RT Vol. 16 at 73.

M. Conclusions.

Colorado allowed hundreds of wells to be constructed in the river alluvium without regard to their impact upon the surface flows of the Arkansas River, either in Colorado or in Kansas. Data on the number of wells and magnitude of their pumping were not generally known until the studies of the mid- to late 1960s. Yet postcompact pumping in Colorado clearly depletes the surface flows of the Arkansas River. While many of the studies showing such depletions covered the river from Pueblo *to* the Stateline, it is difficult to conceive that flows *across* the Stateline were not also depleted.

Colorado's efforts to regulate pumping were heavily tempered by its own economic considerations. The adopted concept of obtaining "maximum use" of the waters of the state through the pumping of groundwater ignored the downstream impact in Kansas and the rights of Kansas under the compact. Regulation under the 1973 Rules has not effectively reduced pumping, although perhaps pumping would have been even greater without such control. Nor does the evidence show that the augmentation plans have significantly offset the depletions from wells. Under appropriate circumstances, the conjunctive use of surface diversions and groundwater pumping can effectively increase available water supply, but any such effort cannot be focused solely on the benefits to Colorado users as though they are entitled to

consume the full supply. If a program of limited conjunctive use has any potential along the Arkansas (and there was no evidence on this matter during the liability phase of the trial), the program must also include Kansas' rights under the compact.

SECTION XII

DEPLETIONS OF STATELINE FLOW

The actual quantities of water in the Arkansas River flowing into Kansas are not in dispute. Stateline flows are gaged by the United Stages Geological Survey, and adjusted for diversions made by the Frontier Ditch just across the border in Colorado and delivered for use in Kansas. Stateline flows, as adjusted, for the period 1950-85 are set forth in the tables below. These amounts represent total annual flows, not usable flows. They include flood flows for years like 1965 when measured quantities reached 749,070 acre-feet, compared to a 1950-85 annual average of 144,051 acre-feet. The figures set forth below are for compact years, which run from November 1 to October 31.

The quantities of water in the left-hand column are those presented by Colorado.[52] Those in the right-hand column were tabulated by the United States, but based on Kansas data.[53] Kansas itself did not prepare a table of annual Stateline flows, but presented its data only in bar graphs and similar exhibits. While the amounts in the two columns are not identical, they are so close that total numerical flows have not been an issue.[54]

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[52] Taken from Colo. Exh. 4*, Table 5.8.

[53] Taken from U.S. Exh. 12.

[54] Colorado expert Helton testified that these Colorado data from Colorado Exhibit 4*, Table 5.8, were not in question, and Kansas never disputed this claim. The differences may result from the use of slightly different periods of time.

YEAR	COLORADO DATA	KANSAS DATA
1950	193214	
1951	278941	278854
1952	107524	107050
1953	99354	99355
1954	102055	102147
1955	155009	155021
1956	97596	97405
1957	178131	178106
1958	164122	164112
1959	199460	199340
1960	125301	124862
1961	105791	105715
1962	124762	124872
1963	67709	67726
1964	81340	81155
1965	749070	749058
1966	277191	277151
1967	216221	216372
1968	114824	114480
1969	143634	143650
1970	140272	140290
1971	113502	113622
1972	117682	117409
1973	118007	118120
1974	61709	61814
1975	44454	44417
1976	32363	32250
1977	30745	30756
1978	43486	43547
1979	19805	19775
1980	127174	127148
1981	63569	63575
1982	82224	82101
1983	166953	166889

1984	197299	196905
1985	245354	245335
	Average 1950-85: 144051	Average 1951-85: 142582

A. Precompact Flows.

There is no doubt that Stateline flows in the postcompact years have averaged less than the flows in earlier years. During the compact negotiations, the engineering committee used the period of 1908-42 for the collection and analysis of data. Stateline flows during that period averaged 280,800 acre-feet annually. Jt. Exh. 5, Table D, at 16. Even during the dry period of 1931-40, Stateline flows averaged 146,200 acre-feet annually, thus exceeding the postcompact period, which includes some very wet years. *Id.* The 1944 proposal by Chief Engineer Patterson of the Colorado Water Conservation Board was based upon average flows for 1908-38 amounting to 260,700 acre-feet annually. Jt. Exh. 8 at 22. The 1968 W. W. Wheeler Report authorized by the Colorado legislature puts average Stateline flows for 1924-41 at 194,250 acre-feet per year, and for 1943-50 at 237,160 acre-feet. Jt. Exh. 92 at 14-15. This report carefully eliminated from its averages the enormous flows of 1942 which amounted to 1,317,590 acre-feet. *Id.* at 14, 17. The 1975 report prepared by the Colorado state engineer showed average Stateline flow for 1935-50 of 280,900 acre-feet per year. Jt. Exh. 94 at 49. In short, all of the studies of precompact flows showed amounts that were substantially greater than those occurring during the postcompact period.

A simple comparison, however, between precompact and postcompact flows can be misleading. John Martin Reservoir must be taken into account. That reservoir went into operation just before the compact was finalized, and it was always known and intended that John Martin would alter the regimen of river flows. The conservation pool was specifically designed to store flows that otherwise would have reached the Stateline but would have been unusable. It was well understood that under the compact Colorado would receive roughly 60 percent of the conserved water, with the remainder being available for use in Kansas.

The issue now, however, is whether the reduction of flow into Kansas has been greater than it should have been, or more precisely, whether activities in Colorado have caused a material depletion of usable Stateline flows.

B. Postcompact Depletions.

Colorado has never denied the fact that postcompact flows at the Stateline have declined.[55] Even apart from comparisons with earlier years such as 1908-42, it is evident that Stateline flows have declined since the adoption of the compact. Looking at the early postcompact years from 1950-64, Stateline flows averaged 138,687 acre-feet annually.[56] While in the later 1966-85 period, the average fell to 117,823 acre-feet per year, or a loss of almost 21,000

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[55] See, e.g., RT Vol. 114 at 115-116.

[56] Computed from Colorado Exhibit 4*, Table 5.8, and the table set forth above.

acre-feet annually. (In this comparison I have simply omitted the flood year of 1965 because of its abnormal flows of 749,070 acre-feet.)

Colorado takes issue with Kansas, however, over the causes of the decline. Colorado's expert Duane D. Helton[57] testified that the depletion has been the result of a combination of causes: decreased flow from the tributaries, increased use by phreatophytes, and "partly" from well pumping. RT Vol. 114 at 116. Colorado's state engineer also acknowledged that the 76 wells constructed after 1965 in the Buffalo Canal area depleted Stateline flows. RT Vol. 77 at 23-26; see also Miles testimony, RT Vol. 66 at 47. However, trying to calculate what usable Stateline flows would have been in the absence of the compact violations alleged by Kansas (namely, postcompact pumping in Colorado and the WWSP) is a most formidable task.

Both states used computer models in an effort to isolate the impacts of postcompact well pumping and of the Winter Water Storage Program. Helton agreed there was a trend of increase in depletions of Stateline flows as a result of higher pumping, and that the highest depletions occurred in the mid- to late 1970s. RT Vol. 133 at 57-58. This evidence is discussed at length in Sections

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[57] Mr. Helton was one of Colorado's principal expert witnesses. He holds a master's degree in water resources engineering from the University of Colorado, and worked for 11 years as an engineer with the Colorado Water Conservation Board. Since 1982 he has been with Tipton and Kalmbach, Inc. of Denver, and is now vice president of that firm and chief of its water rights section. Probably no witness was more knowledgeable about all facets of the Arkansas River than Mr. Helton.

XVIII, XIX and XX. However, Colorado asserts certain legal defenses which first need to be addressed. Colorado argues (a) that Kansas should be barred by laches from asserting any claims for well pumping which occurred prior to 1965, and (b) that the impact from pumping below John Martin Reservoir should be offset by benefits to Kansas resulting from the 1980 Operating plan. As part of the argument on the Draft Report, alternate modifications to both of these positions were put forward. These two issues are next analyzed.

SECTION XIII

EQUITABLE DEFENSES

A. Colorado's Claim.

In its Answer to Kansas' First Amended Complaint, Colorado raised affirmative defenses of laches, estoppel, waiver and unclean hands. In Colorado's post-trial briefs, acquiescence was added. However, Colorado states that it has not tried to "pigeonhole" Kansas' actions under any of these labels. Colo. Closing Well Br. at 44. Rather Colorado has focused on those factors which traditionally have been considered by courts of equity in rendering judgments. To that end, Colorado argues that Kansas should be barred from complaining about the effects of well development that occurred prior to 1965. It is undisputed, Colorado asserts, that Kansas did not complain about well development in Colorado until 1985, although the facts had been common knowledge since at least the mid-1960s.

In the alternative, Colorado asserts that Kansas' delay must "gravely add to the burden [it] would otherwise bear, and must be weighed in estimating the equities of the case." Colo. Closing Well Br. at 49, quoting from *Colorado v. Kansas*, 320 U.S. 383 at 394.

As part of the argument on the Draft Report, Colorado urged an alternate approach to laches that "would produce a fairer result." Colo. Oral Argument Memorandum at 2. Instead of aiming at well construction, Colorado suggested that the focus be on well pumping, and that such pumping be treated in the nature of a continuing nuisance. *Id.* at 4. Viewed in that light, Colorado

argued that laches might bar damages for pumping through the mid-1970s, which had occurred without complaint, but not the "increased well pumping which occurred in later years." *Id.* at 4-5. To accept this argument, Colorado stated, would not produce a bar to any prospective remedy. RT Vol. 142 at 110.

Colorado initially alleged prejudice in two respects. First, that Kansas' failure to complain in a timely fashion has made it difficult for Colorado to defend itself and to determine key factual issues because of a lack of data from the early years. Colorado points particularly to the lack of data on groundwater pumping and water levels before 1965, the amount of inflow from ungaged tributaries, and the flows passing Garden City from 1970-85. However, I doubt that complaints from Kansas realistically would have made any difference in Colorado's data collection system. I note that the 1968 W. W. Wheeler Report which was authorized by the Colorado legislature recommended that "Accurate and continuous discharge records be obtained of major tributary inflow," and that "Recorders be installed on all wells." Jt. Exh. 92 at vii. Yet nothing substantial was done. Indeed, these recommendations still have not been implemented.

Insofar as Colorado complains about a lack of data for the early years, it should also be remembered that before 1965 Colorado had no administrative system for the regulation of wells. Moreover, it was not until 1957 that any kind of well registration system was enacted. Prior to that date, wells could be and were constructed without the knowledge of the state. And even after 1957,

the issuance of a well permit was a ministerial act without consideration of any impact on prior vested rights. RT Vol. 76 at 25, 106.

Colorado's second claim of prejudice is that Kansas allowed a valuable economy to develop based on the use of irrigation wells to supplement surface supplies. Without complaint from Kansas for more than twenty years, Colorado alleges, investments were made to construct wells, install pumps, line farm ditches, and level land based on the use of irrigation wells. (This claim is dealt with in Section C.2 below.)

With respect to a bar against damages for pumping before the mid-1970s, Colorado argues that Kansas' failure to complain allowed Colorado to act in a way thought to be acceptable, in essence depriving Colorado of the opportunity to mitigate damages. RT Vol. 142 at 110-11.

B. The Availability of Equitable Defenses as a Matter of Law.

Kansas contends that laches is not applicable in this type of case. Laches is of course a doctrine of equity jurisprudence. It is well recognized that this defense requires more than mere delay; there must also exist some prejudice to the other party which has resulted from the delay, so that it would be unfair – inequitable – to allow the claim. See *Tustin Community Hospital, Inc. v. Santa Ana Community Hospital Ass'n.*, 89 Cal.App.3d 889, 895-96, 153 Cal.Rptr. 76, 80-81 (1979); 30A CJS 353 (Equity § 129): "Laches is such delay in enforcing one's rights as works disadvantage to another." Later in this report the

question whether there has been such prejudice is discussed, but first it is appropriate to consider whether laches is available to Colorado at all.

No interstate compact enforcement case has been found in which the Supreme Court has directly held that laches does or does not apply. One of the arguments in favor of the applicability of laches is based on the fact that the Court has described its jurisdiction in these cases as "basically equitable in nature." *Ohio v. Kentucky*, 410 U.S. 641, 648, 35 L.Ed.2d 560, 567, 93 S.Ct. 1178 (1973). But there is a major exception to the applicability of laches, even in equity cases; it is generally held not to apply against a public agency. *Utah Power and Light Co. v. United States*, 243 U.S. 389, 409, 61 L.Ed. 791, 818, 37 S.Ct. 387 (1917); 30A CJS 358 (Equity § 131). This is especially true of disputes at the state or national level. *Utah Power and Light Co. v. United States, supra*, 243 U.S. at 409, 61 L.Ed. at 818; *Illinois v. Kentucky*, 500 U.S. 380, 114 L.Ed.2d 420, 430, 111 S.Ct. 1877 (1991). The rationale is often said to be that the public interest should not be penalized by the inattention of public officers. Although there are decisions allowing laches against public interests, especially in cases involving municipal corporations or administrative agencies, or where exceptional prejudice is involved (30A CJS 358 [Equity § 131]), it continues to be the rule that states are generally exempt. *Id.*

It would be a mistake, however, to decide the issue solely on the basis of conventional equity rules. In establishing the Supreme Court's original jurisdiction over litigation between states, the constitution does not speak of "cases in law or equity," as it does in certain other situations. Rather it refers simply to "controversies"

between states. Commentary on the difference between cases and controversies has been inconsistent and inconclusive (see 36 CJS 20 [Federal Courts § 1]; 1A CJS 302, 315, 316 [Actions §§ 1, 5c, 6]), but the constitutional language does suggest that the interstate jurisdiction is not necessarily locked into rules of either common law or equity. And in exercising this "unprecedented" grant of judicial power (Charles Warren, "The Supreme Court and Sovereign States," [Stafford Little Lectures for 1924], Princeton Univ. Press, p. 32), the Court has treated it as sui generis – a substitute for the treaty and war powers which the states surrendered when the constitution was established. *Rhode Island v. Massachusetts*, 37 U.S. (12 Pet.) 657, 725, 9 L.Ed. 1233, 1260 (1838); *Kansas v. Colorado*, 185 U.S. 125, 140, 46 L.Ed. 838, 844, 22 S.Ct. 552 (1902); *North Dakota v. Minnesota*, 263 U.S. 365, 372-73, 68 L.Ed. 342, 345, 44 S.Ct. 138 (1923); *Idaho v. Oregon*, 462 U.S. 1017, 1031, note 1, 77 L.Ed.2d 387, 400, 103 S.Ct. 2817 (1983).

As Chief Justice Taney explained in 1855, traditional chancery practice is an "analogy" in these cases but is not controlling. *Florida v. Georgia*, 58 U.S. (17 How.) 478, 492, 15 L.Ed. 181, 189 (1855). Thus viewed, the inquiry really is one of fundamental justice rather than what is the historical or even the current practice of courts exercising less extraordinary powers. It is in this sense that the Court has observed that proceedings under its original jurisdiction are "basically" equitable in nature. *Ohio v. Kentucky, supra*, 410 U.S. at 648, 35 L.Ed.2d at 567, 93 S.Ct. 1178 (1973).

The Supreme Court has referred to a broad policy in interstate boundary disputes disfavoring the untimely assertion of rights (see *Illinois v. Kentucky, supra*, 500 U.S.

at 388, 114 L.Ed.2d at 431, 111 S.Ct. at 1883 (1991)), but that policy has been asserted in other situations as well. Thus, in a nuisance action involving sewage contamination of the Mississippi River, Justice Holmes observed that it would be "contradicting a fundamental principle of human nature to allow no effect to the lapse of time, however long." *Missouri v. Illinois*, 200 U.S. 496, 520, 50 L.Ed. 572, 578, 26 S.Ct. 268 (1906). And, as noted above, the Court held in *Colorado v. Kansas*, 320 U.S. 383, 394, 88 L.Ed. 116, 124, 64 S.Ct. 176 (1943), that Colorado's improvements and Kansas' inaction in the twenty-one years following the 1907 Arkansas River decision "gravely add to the burden [Kansas] would otherwise bear and must be weighed in estimating the equities of the case." See also *Washington v. Oregon*, 297 U.S. 517, 528, 80 L.Ed. 837, 843, 56 S.Ct. 540 (1936). Clearly, although it is not based on equity jurisprudence as such, the rule to be followed here is that there is some point at which unexcused delay by a state in connection with an interstate apportionment will work to bar relief.

In applying such a principle, it should be borne in mind that no statute of limitations is applicable in this case, and therefore there is no outside limit to the period during which delay will be tolerated. The test should not be any particular number of years, but rather the degree of prejudice to the state claiming laches. *Tustin Com. Hosp. v. Santa Ana Com. Hosp., supra*, 89 Cal.App.3d at 895-96, 153 Cal.Rptr. at 80-81; 30A CJS 353 (Equity § 129).

C. The Facts Do Not Support a Claim of Laches or Other Equitable Defense.

Colorado seeks to bar relief based upon impacts from wells drilled before 1965. This would include almost all of the wells in existence in 1985. According to Colorado's own data, in 1985 there were 2062 large irrigation wells with a capacity of 100 gpm or more. Colo. Exh. 165*, Table A.1. Of that total, 1842 were in existence before 1965. *Id.* According to Colorado, Kansas did not register any formal complaint until 1985. Colo. Closing Well Br. at 13, 44; RT Vol. 78 at 109; RT Vol. 115 at 63-64. This assertion is essentially correct.

1. The Timing of Kansas' First Complaint Against Pumping.

On March 28, 1985, at the instance of Kansas, the compact administration pursuant to Article VIII-H undertook a formal investigation of compact violations alleged by Kansas. Included in the investigation were the issues of whether "well development of the waters of the Arkansas River in Colorado," and the operation of the Winter Water Storage Program had caused a material depletion in river flows. Jt. Exh. 28. In late 1983 Kansas had undertaken its own study of Stateline depletions through the firm of Simons, Li & Associates. The actual work was done largely by Brent E. Spronk and Dale E. Book, both of whom later became principal witnesses for Kansas at the trial. The Simons, Li report was completed in February, 1984 and made available to the compact administration. Jt. Exh. 19, Minutes of 3-28-85 at 99-100. That study concluded that a conservative estimate of

Stateline depletions due to postcompact wells for the 1974-81 period was between 40,000 and 50,000 acre-feet per year. Jt. Exh. 88 at v. Prior to this time, however, the records of the compact administration reflect very little about the impact of postcompact well development in Colorado.

The minutes of December 14, 1976 include a brief remark from a member of the audience. Stating that 25 additional wells were being put in along the Kansas line, he commented, "so I don't know whether you are ever going to get any water to the Kansas line again or not." Jt. Exh. 19, Minutes of 12-14-76 at 74.

The first extensive consideration of pumping impact shows up in the minutes of April 23, 1977. And then it came not from Kansas but rather from Harry L. Bates, one of the compact commissioners from Colorado. Bates represented Water District 67, the area downstream of John Martin Reservoir, which of course has some interests similar to those of Kansas. He submitted an "Historical Data" report which compared two ten-year periods of postcompact operations. Jt. Exh. 19, Minutes of 4-23-77 at 39-50. The report concluded that average storage in John Martin Reservoir had declined by more than 54,000 acre-feet annually, and that the decline could not be explained by weather changes. The four causes which, "in bitter fact," had caused the depletion were listed as: a heavy increase in upstream winter irrigation; a "proliferation of wells pumping from the aquifer hydraulically connected to the live river stream above John Martin"; the transfer of some agricultural rights to municipal and industrial

use; and the re-regulation of river flow by Pueblo Reservoir. Jt. Exh. 19, Minutes of 4-23-77, Historical Data report.

Bates' report was taken up again at the December 13, 1977 meeting, but nothing appears to have come of it. The comment was made at that meeting that most of the items in the report were either outside of the compact administration's jurisdiction, or were before the courts, or were being studied and resolved by other authoritative agencies. Jt. Exh. 19, Minutes of December 13, 1977, at 6. The compact leaves the primary administration of water rights with the states. Article VI-A(2).

There was also discussion of a pending agreement between the City of Lamar and Iowa Beef Producers, Inc. for the purchase of land and water rights in the Lamar area. The minutes state:

> "The Compact Administration was concerned that there might be more wells drilled and thus further deplete the river water." Jt. Exh. 19, Minutes of 12-12-78 at 8.

In regard to possible supplemental wells, the minutes reflect an explanation that "applications would have to be made to the Water Court for permit of augmentation" and that the division engineer did not anticipate any new wells being drilled. *Id.*

With these exceptions, I have found nothing in the record of the compact administration proceedings from 1950 to 1985 that reflects any complaint by Kansas about pumping in Colorado. The record supports Colorado's assertion that no formal complaint to the compact administration, or indeed to any appropriate Colorado officials,

was made before 1984 (if the Simons, Li report is considered as such) or otherwise before 1985, when Kansas asked the compact administration to undertake an Article VIII-H investigation.

2. The Need to Show Prejudice.

Laches does not result merely from the passage of time. The defendant must be prejudiced by the delay. *Gardner v. Panama Railroad*, 342 U.S. 29, 96 L.Ed. 31, 72 S.Ct. 12 (1951); *Southern Pacific Co. v. Bogert*, 250 U.S. 483, 63 L.Ed. 1099, 39 S.Ct. 533 (1919); *Russell v. Todd*, 309 U.S. 280, 84 L.Ed. 754, 60 S.Ct. 527 (1940). Here the farmers in Colorado after 1950 drilled new wells and expanded the use of older wells without the official knowledge of either Colorado or Kansas. They relied upon Colorado law as it then existed, not upon inaction by Kansas. Prior to 1957 a well could be drilled in Colorado without any state permit, and without the knowledge of the state. Colorado did not even begin to collect well data until 1957. RT Vol. 76 at 101. Even then, it had no program for reporting or determining the amount of water pumped. In *Kuiper v. Atchison, Topeka & Santa Fe Ry. Co.*, 195 Colo. 557, 581 P.2d 293 (1978), the Supreme Court of Colorado stated:

> "Prior to the adoption of the 1973 Rules, there had been virtually no regulation of wells in the basin, and consequently no empirical data as to the effect upon surface rights in the basin of regulation of wells." Colo. Exh. 387 at 296.

There is no evidence in the record that Kansas knew, or should have known, of the extent of postcompact well pumping in Colorado until virtually all of the additional

wells had been constructed. Nor is there any evidence that farmers in Colorado knew that Kansas had any interests that might be affected by their pumping. Under Colorado statutes (apart from any consideration of the compact) their well development was lawful. The construction of new wells and the increase in pumping did not occur because Kansas failed to complain, but rather because of the economic value of wells to the Colorado farmers, and the fact that such wells were not wrongful under Colorado law. Wells, in and of themselves, do not violate the compact.

Once the farmers in Colorado, relying upon Colorado law, had made those well investments, the passage of time would not create prejudice. On the contrary, delay or inaction by Colorado or Kansas in bringing about well regulation permitted the benefits of those wells to be increasingly enjoyed and such investments amortized.

Insofar as Colorado further claims prejudice because of the lack of data from the precompact or early postcompact years, I find that such data was simply not being collected at that time. The lack of data suggests that neither state could be expected to have been aware of the effect of pumping. Kansas also makes the point with some merit that the Colorado experts testifying to such pumping did not make any serious complaint about the lack of pre-1965 data. Colo. Exh. 165*; RT Vol. 69 at 51-54; RT Vol. 71 at 5-142; RT Vol. 72 at 4-131; RT Vol. 114 at 19-22, 28, 39. To be sure, power records for 1940-60 were incomplete, and this made the task of estimating pumping more difficult; but missing years were accounted for by using regression techniques, and Helton testified that

Colorado's ultimate pumping estimates were reasonable. Colo. Exh. 165* at 3; RT Vol. 115 at 58.

During the period from 1963 to 1968, the USGS made a "comprehensive evaluation" of the hydrology of the Arkansas River Valley in Colorado. Jt. Exh. 66 at 1. The purpose of the study was "to provide basic information to water users and State and local agencies for the planning, management, and administration of the water resources." *Id.* An actual field inventory of all large scale irrigation wells was conducted. The report, published in 1970 as "Basic-Data Release No. 21," included location maps of wells, the saturated thickness of valley-fill deposits, water level measurements, well records, chemical analyses of water from selected wells, pump data, and pumping estimates over the years beginning in 1940. Certainly the USGS used and collected all the data then reasonably available. If Colorado has suffered any prejudice because of data missing prior to 1963, it is not because Kansas failed to complain about pumping, but simply because the data were not kept. Colorado, however, says the issue is not what data were being collected, but what evidence "would have been available" if a timely complaint had been made. Colo. Oral Argument Memorandum at 16. This argument presupposes that Colorado, in essence, would have done earlier what the USGS did between 1963 and 1968 – a highly speculative assumption.

Colorado also argues that it has been deprived of the testimony of "highly knowledgeable" witnesses who could prove that Kansas acquiesced in upstream well development. Colo. Oral Argument Memorandum at 12. Colorado refers to George Knapp, William Leavitt,

Roland H. Tate and R.V. Smrha who were Kansas' early representatives to the compact administration. All except Smrha died between 1964 and 1967. If the issue involved compact interpretation, the testimony of these leading figures might indeed be useful. But there is no evidence to suggest that these men acquiesced in compact violations. The records of the compact administration are completely devoid of any reference to well pumping in Colorado during this period of time.

3. The Issue of Common Knowledge.

Colorado argues that the facts concerning well development in Colorado were open, notorious and of common knowledge, and that Kansas should have been on notice of the potential impact by the mid-1960s, if not earlier. Colo. Closing Well Br. at 14, 45; Colo. Reply Br. at 8. Colorado cites several reports, two Colorado Supreme Court decisions, and the state's controversial efforts to regulate wells. Jt. Exhs. 66, 78, 91, 92, 94; Colo. Exhs. 384, 387.

Colorado's efforts to regulate wells began in 1965 with enactment of a statute directing the state engineer to administer wells within the priority system. Colo. Exh. 378. The state engineer's initial effort to shut down 39 wells under that statute was set aside in 1968 by the Colorado Supreme Court. Colo. Exh. 384. Neither the 1965 legislation, nor the Court decision, dealt with depletions of flow into Kansas. At the direction of the Colorado legislature, the Wheeler Report was published in 1968. Jt. Exh. 92. That report estimated pumping between 1940 and 1965, showing an increase from 2300 acre-feet in 1940

to a 1960-64 average of 168,200 acre-feet. Jt. Exh. 92 at 22. The report seems to indicate that pumping in the order of 114,000 acre-feet annually would not interfere with an average demand by Kansas during 1951-64 of 42,000 acre-feet per year. *Id.* at 23.

In 1970 the USGS published a comprehensive report on wells along the Arkansas River between Pueblo and the Stateline. Jt. Exh. 66. It found that the groundwater supply was developed mainly from 1950 to 1965 when approximately 1000 large-capacity irrigation wells were drilled. *Id.* at 5. The report estimated that pumping increased from 31,000 acre-feet to 185,000 acre-feet annually in the period 1950 to 1965. *Id.* However, the impact on streamflow was not studied.

Another USGS report was published in 1974. Jt. Exh. 78. This report published the results of a mathematical model simulating the stream-aquifer system of the Arkansas River from Pueblo to the Stateline. While Colorado experts at the trial were critical of the accuracy of this model, it nonetheless simulated Stateline depletions due to well pumping in Colorado during the 1941-65 period of 67,000 acre-feet annually. Jt. Exh. 78, Table 2, compare No. 1 with No. 14; RT Vol. 99 at 56-57.

In 1972 the Colorado state engineer issued regulations limiting pumping to three days a week unless a written plan were approved to protect prior vested rights. Jt. Exh. 93 at 2. Subsequent regulations to curtail all pumping that was not under an approved plan were struck down in 1978 by the Colorado Supreme Court. Colo. Exh. 387; *Kuiper v. Atchison, Topeka & Santa Fe Ry. Co.*, 195 Colo. 557, 581 P.2d 293 (1978). The Court in that

decision acknowledged evidence that pumping exceeded 200,000 acre-feet in 1972, but noted that "the restriction of wells does not necessarily result in a comparable increase in the supply of surface water." *Id.* at 295.

In support of these tighter regulations, the Colorado state engineer prepared a report in 1975. Jt. Exh. 94. He concluded that the rapid growth of irrigation wells during the period from the late 1940s to the early 1960s had decreased the amount of river water available for surface water appropriators, and had deprived senior water users of a portion of their lawful supply. *Id.* at 1, 53. He quantified the reduction for the period 1965-72 at an average of 112,800 acre-feet per year, but testified later during the trial of this case that such reduction would not translate directly into Stateline depletions. *Id.* at 53; RT Vol. 78 at 85.

None of these reports or court decisions deal with the issue of impact on usable flow at the Stateline. Yet wells *per se* are not wrongful under the compact. Only if they cause a material depletion in usable flows would they be in violation. Determining what flows are usable, and the depletions of usable flow in contrast to depletions of total flow, is not simple. In fact, one of Colorado's experts testified that "surplus" water was available through the 1950s and 1960s, and at least during that period there was little impact on usable flows from upstream well development. RT Vol. 115 at 62-64. Moreover, in his opinion, the only feasible way to develop the unused waters of the Arkansas River was through wells, "and that is what both States did." RT Vol. 86 at 78-79; Colo. Closing Well Br. at 22. Apparently the Colorado state engineer continued to grant well permits downstream from John Martin during

the 1970s because he also thought that unappropriated water was still available and Kansas would not be adversely impacted. RT Vol. 76 at 112-115; RT Vol. 81 at 156. However, Danielson, the next state engineer, ceased issuing such permits in 1979 because he believed that further appropriation without a replacement or augmentation plan would cause injury. RT Vol. 76 at 116.

The regulations adopted by the state engineer for the control of wells in Colorado were intended to protect surface water users in Colorado, not flows into Kansas. RT Vol. 76 at 117-120. The state engineer was under a specific statutory duty to make and enforce such regulations as would enable the State of Colorado to meet its compact commitments. C.R.S. § 37-80-104. However, Dr. Danielson said that no such rules had ever been prepared for the Arkansas River "because it was never determined necessary to define an intrastate administrative scheme to meet that obligation." RT Vol. 76 at 86, 120.

Isolating the impacts of wells on usable Stateline flow was made all the more difficult because of other changing conditions during the 1970s and early 1980s. The 1970s were generally dry years and some reduction in flow was to have been expected. Pueblo Dam came on line in 1976 and began to reregulate native flows. Transmountain imports increased, which to some extent provided an offset to pumping. The 1980 Operating Plan was placed into effect, which Colorado alleges offset the impacts of increased pumping downstream from John Martin Reservoir. The Winter Water Storage Program was instituted. Moreover, there was no quantitative or specific entitlement against which depletions to usable flow could be

judged. Nor were there any agreed upon criteria for establishing what flows were usable.

Indeed, as late as 1985, a key Colorado representative took the view that acknowledged declines in usable Stateline flows were not caused by pumping, but rather appeared to result from other factors. In a report dated October 4, 1985, made to the compact administration pursuant to its Article VIII-H investigation, J. William McDonald, one of the Colorado compact commissioners, acknowledged that there had been "a substantial decline in usable stateline flows starting in 1974." Jt. Exh. 32 at 4. However, he concluded that the decline "was directly related to a decline in tributary inflow from plains drainage areas, combined with below-average flows at Las Animas." *Id.* at 5, 9, 12, 19. He refused to permit a compact administration investigation of well development in Colorado "when the single and double-mass diagrams do not suggest that well development in Colorado has had an impact on usable stateline flows." *Id.* at 23. McDonald did not agree with the conclusions in Kansas' report on well pumping. Jt. Exh. 31 at 33-34. Kansas argues that neither state was actually aware that well pumping was causing material depletions of usable flow at the Stateline until the compact administration investigation in 1985. RT Vol. 142 at 128-29.

Colorado also relies upon the depositions of three Kansas officials to demonstrate that Kansas was on notice of the well development in Colorado. These officials were Carl Bentrup, a Kansas representative to the compact administration for more than thirty years; Guy Gibson, employed by the Kansas Division of Water Resources for forty-three years and serving as chief engineer for eleven

years before his retirement in 1983; and Howard Corrigan, the former Kansas water commissioner of the Garden City field office. Their depositions, which were introduced into evidence, show that these men were aware of some well development in Colorado, and that some informal discussions occurred within the compact administration. However, the evidence is sketchy and does not demonstrate that these officials were aware of the number of wells, the extent of Colorado's pumping, or the impact or even potential impact of pumping on usable Stateline flows. Colorado frequently refers to "well development," but that alone does not violate the compact.

D. Application of an Equitable Statute of Limitations.

During argument on my Draft Report, Colorado presented a "slightly different twist" to the application of laches. RT Vol. 142 at 100. Colorado argued that Kansas had not complained about pumping until 1984 or 1985; that in the early postcompact years, Colorado was not aware there was a problem, and had acted in good faith; and that it is fundamentally unfair under those circumstances to permit Kansas to reach back to 1950 for its damages, either in water or in money. RT Vol. 142 at 110-11, 117, 149. Colorado urges that I "strongly consider imposing an equitable statute of limitations,[58] so that we

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[58] Colorado was not aware of any applicable federal statute of limitations, nor am I. RT Vol. 142 at 118.

are not in a position of paying for sins that weren't sins." RT Vol. 142 at 118.

Colorado also accuses Kansas of sleeping on its rights, saying that is the issue. RT Vol. 143 at 52; RT Vol. 142 at 110. This latter argument, however, seems to undercut Colorado's reliance on its own good faith. At least, Colorado's argument requires that Kansas recognize a potential compact violation while Colorado is excused.

In any event, Kansas relies upon *Texas v. New Mexico*, 482 U.S. 124, 96 L.Ed. 2d 105, 107 S.Ct. 2279 (1987) for the proposition that acting in good faith does not excuse a compact violation. There, the Court stated at page 129:

> "But good-faith differences about the scope of contractual undertakings do not relieve either party from performance. A court should provide a remedy if the parties intended to make a contract and the contract's terms provide a sufficiently certain basis for determining both that a breach has in fact occurred and the nature of the remedy called for. Restatement (Second) of Contracts § 33(2), and Comment b (1981). There is often a retroactive impact when courts resolve contract disputes about the scope of a promisor's undertaking; parties must perform today or pay damages for what a court decides they promised to do yesterday and did not. In our view, New Mexico cannot escape liability for what has been adjudicated to be past failures to perform its duties under the Compact."

In *Texas v. New Mexico* the Court upheld a total shortfall of 340,100 acre-feet that had accumulated over the period 1950-83, and permitted money or water damages

for that amount. 482 U.S. at 127-28. Under a compact signed in 1948, New Mexico was barred from depleting the flow of the Pecos River at the New Mexico-Texas border below that which was available to Texas under 1947 conditions. An engineering advisory committee drafted an Inflow-Outflow Manual to determine how much water Texas should expect to receive over any particular period for any particular levels of precipitation, under the consumption conditions prevailing in New Mexico in 1947. However, it became clear "soon after the Compact went into effect" that the Inflow-Outflow Manual did not describe the actual state of the river. *Texas v. New Mexico*, 462 U.S. 554, 560, 77 L.Ed. 2d 1, 103 S.Ct. 2558 (1983). In almost every year following adoption of the Compact, flows at the state line were significantly less than the levels predicted by the Manual, with no obvious changes in either natural conditions or uses in New Mexico.[59] As a result, the basic meaning of the 1947 condition was not defined until 1979, and a workable methodology for translating New Mexico's obligation into quantities of water was not achieved until 1984, in the course of the litigation between the states. The Master reported in 1982 that New Mexico's obligation "is still uncertain," and that New Mexico "had acted in good faith." *Texas v. New Mexico*, 482 U.S. 124, 129, 96 L.Ed. 2d 105, 107 S.Ct. 2279 (1987). Nonetheless, when the obligation was finally determined, the shortfall was assessed back to 1950.

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[59] The Inflow-Outflow Manual proved to be so faulty as to be unusable.

Colorado attempts to distinguish these Pecos River decisions, arguing that between Texas and New Mexico there had been "an ongoing and consistent pattern of ignored complaint." RT Vol. 142 at 110. This appears to be somewhat of an overstatement. For the first 15 years the Pecos River Commission[60] functioned in "apparent harmony," albeit under a tacit agreement to defer the problem of determining the required flows at the state line. *Texas v. New Mexico*, 462 U.S. 554, 560, 77 L.Ed.2d 1, 103 S.Ct. 2558 (1983). The dispute surfaced sometime after 1962 and came to a head in 1970. *Id.* at 561. Texas invoked the original jurisdiction of the Supreme Court in 1974. *Id.* at 562. While there is no indication that laches was raised in the *Texas v. New Mexico* litigation,[61] the Court's decisions there seem to militate against Colorado's theory of an equitable statute of limitations.

In the final analysis, however, statutes of limitation are not a truly appropriate analogy to the argument Colorado now makes. Such statutes are characterized by the specificity of their terms and the rigidity with which they tend to be applied. Laches, on the other hand, can be as flexible as the circumstances of each particular case require. Although, as already noted, various rules are ordinarily followed in applying laches, it is after all simply a tool of equity in the task of reaching a fair decision.

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[60] Comparable to the Arkansas River Compact Administration.

[61] New Mexico argued that this Court could require only the future performance of compact obligations, without any remedy for past breaches. 482 U.S. at 128.

This flexibility is especially present in the original jurisdiction, which follows chancery jurisprudence only as an analogy and which looks ultimately to fundamental principles of justice. *Florida v. Georgia, supra,* 58 U.S. (17 How.) 478, 492, 15 L.Ed. 181, 189 (1855).

Thus, the decision to accept or reject Colorado's request to exclude the early years of excess pumping lies within the sound discretion of the Court. If the Court is inclined to approve any such exclusion, my recommendation is that it should not cover the full 25 years urged by Colorado, but at most should apply only to damages from pumping that occurred before 1965. By 1965, the Colorado legislature was fully alerted to the potential impact of wells on surface flows throughout the state, and acted to require the state engineer to administer underground waters tributary to surface flows in accordance with the priority system. Colo. Exh. 378, C.R.S. § 148-11-22. After that time, the "good faith" underpinning of the Colorado position begins to erode.

Apart from Colorado's present arguments, and apart from any prospective relief, equitable considerations may still be appropriate during the remedy phase of the trial. If the Court upholds my recommendation on liability caused by postcompact pumping, it will be necessary to determine the amount of depletions of usable Stateline flow. The Court's decisions permit a remedy for past shortages either in water or money. With respect to ordering deliveries of water, the Court has stated:

> "To order making up the shortfalls by delivering more water has all the earmarks of specific performance, an equitable remedy that requires

> some attention to the relative benefits and burdens that the parties may enjoy or suffer as compared with a legal remedy in damages. '[S]pecific performance is never demandable as a matter of absolute right, but as one which rests entirely in judicial discretion, to be exercised, it is true, according to the settled principles of equity, but not arbitrarily and capriciously, and always with reference to the facts of the particular case.' Haffner v. Dobrinski, 215 US 446, 450, 54 L Ed 277, 30 S Ct 172 (1910). Specific performance will not be compelled 'if under all the circumstances it would be inequitable to do so.' Wesley v. Eells, 177 US 370, 376, 44 L Ed 810, 20 S Ct 661 (1900)." *Texas v. New Mexico*, 482 US 124, 131, 96 L.Ed. 2d 105, 107 S.Ct. 2279 (1987).

E. Conclusions.

The extent of postcompact well pumping in Colorado was not generally known until approximately 1968, and there is no substantial evidence that Kansas knew or should have known about the effect of such well development before that time. By then, almost all of the wells of which Kansas now complains had been constructed. By the 1970s the extent of pumping in Colorado was a matter of common knowledge, but that is not to say that the impact of such pumping on usable Stateline flows was generally known or understood. Indeed, it appears not to have been, even in Colorado. I do not believe that Colorado officials thought they were sanctioning a compact violation in the well regulations that were established, or in their failure to adopt specific regulations to protect usable Stateline flows, or in the issuance of new well permits.

There is no specific evidence to explain why Kansas did not complain sooner, but Kansas may well have been relying upon the slowly developing regulatory system in Colorado for protection. This program was evolving all through the 1970s, including the promising concept that augmentation of supplies would be required in order to allow pumping. It is true that the implementation of this requirement has proved lacking, but that result could not have been known at the outset. I think that Kansas had a right to rely, at least initially, upon the Colorado efforts to regulate pumping, and the law should not penalize a state under those circumstances. The compact itself states that, except as otherwise provided, nothing shall supplant Colorado's administration of its water supplies. Article VI-A(2). Moreover, equitable defenses should not be applied in ways to encourage or force early litigation between states, particularly when a state is implementing efforts to address the problem.

I conclude, therefore, that Kansas has not been guilty of inexcusable delay in making its well claim, and that Colorado has not been prejudiced by Kansas' failure to press its claim earlier. Kansas should not be barred by laches or any other equitable defense, including acquiescence, from obtaining relief based on its well claim. In reaching these conclusions, I have fully considered the Court's statement in *Colorado v. Kansas*, 320 U.S. 383 at 394, that unjustified delay must "gravely add" to the plaintiff's burden and be weighed in considering the equities of the case.

No. 105, ORIGINAL

In The

Supreme Court of the United States

October Term, 1985

STATE OF KANSAS,

Plaintiff,

v.

STATE OF COLORADO,

Defendant,

and

UNITED STATES OF AMERICA,

Defendant-Intervenor.

ARTHUR L. LITTLEWORTH, Special Master

REPORT

VOLUME II

July 1994

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SECTION XIV

THE 1980 OPERATING PLAN

Colorado has acknowledged that wells drilled east of the Buffalo Canal headgate after 1965 depleted Stateline flows. For example, in its Closing Brief re Kansas' Well Claim Colorado states:

> "Colorado does not dispute that wells drilled east of the Buffalo Canal headgate after 1965 depleted Stateline flows to some extent during the 1970s." At 19; see also RT Vol. 114 at 116; RT Vol. 77 at 23-26; RT Vol. 66 at 47.

However, Colorado maintains that Kansas received substantial benefits from the 1980 Operating Plan; that these benefits have offset the impact of the wells drilled downstream from the Buffalo Canal after 1965; and that adoption of the plan by the authorized representatives of the two states "should bar any claim by Kansas for breach of compact after 1980." Colo. Closing Well Br. at 49-50; RT Vol. 81 at 156; RT Vol. 115 at 67-68; RT Vol. 133 at 70-74. In a later brief, Colorado said that acceptance of the 1980 plan "should bar any claim against Colorado related to postcompact well development in Colorado or the WWSP since 1980." Colo. Response Br. at 27. A more limited contention was presented during oral argument on the Draft Report.

Kansas responds that there are a number of reasons why the Colorado arguments should fail, "but one of these is fully sufficient." Kan. Answer Br. at 13. Kansas refers to Section VI of the 1980 Operating Plan which reads:

> "Adoption of this resolution [approving the 1980 Operating Plan] does not prejudice the ability of Kansas or of any Colorado ditch to object or to otherwise represent its interest in present or future cases or controversies before the Administration or in a court of competent jurisdiction." Jt. Exh. 21, Doc. 11.

While acknowledging the benefits of the 1980 plan, and while allowing the plan to continue in operation, Kansas nonetheless has taken the position from the outset of the case that the plan constitutes an administrative rewriting of Article V of the compact, and thus "is *ultra vires* and legally void *ab initio*." Kan. Pretrial Statement at 165-66. The same position is maintained in Kansas' Reply Brief at 17, 22. It may be that Kansas is merely wary of the 1980 plan being used to establish an accord and satisfaction, which indeed is an affirmative defense alleged by Colorado – although it is difficult to conceive of an agreement subject to a one-year termination clause as an accord and satisfaction. Put another way, this may be a defense reserved by Kansas if Section VI of the plan should prove not to be sufficient, and if the Court were otherwise to bar relief based upon the benefits of the plan.

In any event, during the trial Kansas did not seek to have the plan invalidated; no such claim is included in the pleadings; and Colorado states that it is unnecessary to resolve the issue of the plan's legality in this case. Colo. Closing Well Br. at 57. I agree. The plan clearly represents a more efficient method of operation of John Martin Reservoir, and is beneficial to both states. There is no reason or need here to consider invalidating it.

A. Operation Under the 1980 Operating Plan.

The 1980 Operating Plan has been briefly discussed earlier in Section V of this Report. Duane D. Helton, a primary expert witness for Colorado, was one of the persons mainly responsible for drafting the plan. Colo. Exh. 17 at 81, 86-87. During the 1970s, Helton was an engineering assistant to the Director of the Colorado Water Conservation Board, the official state member on the compact administration. During many of the administration meetings, Helton represented the Colorado Board. He was also chairman of the special engineering committee that evaluated various water use proposals that came before the compact administration, including the winter water program in Pueblo Reservoir. RT Vol. 115 at 64. Involved in the plan negotiations for Kansas were Howard Corrigan, Carl Bentrup, Guy Gibson, and Fred Stoeckley. RT Vol. 81 at 141. Bentrup testified during his deposition that the 1980 Operating Plan was "the most constructive thing" done while he was a member of the compact administration. Colo. Exh. 17 at 91-92. John Martin Reservoir is still operated pursuant to the plan, as slightly revised in 1984. Jt. Exh. 21, Doc. 29.

Briefly, the 1980 plan divides the water conserved in John Martin Reservoir into separate, individual accounts. Kansas is allocated 40% of the conservation storage, with the remaining 60% being divided in specified percentages among the nine canal companies in Colorado Water District 67. Section II-D(2),(3). Kansas and the various Colorado ditches may demand the release of water contained in their respective accounts at any time, and at whatever

rates they desire. Helton testified that a storage account system had been talked about for years as a way to achieve "greater efficiency" and beneficial use. RT Vol. 81 at 129-130.

The plan also gives three Colorado canal companies, namely, Amity Mutual Irrigation Company, Fort Lyon Canal, and Las Animas Consolidated Canal Company, additional storage rights in John Martin Reservoir. Amity is permitted to store water which it otherwise could divert from the Arkansas River and store in the Great Plains Reservoir System. The other two canal companies may store water approved under the Pueblo winter storage plan, subject to a 20,000 acre-feet limit for Fort Lyon, and a 5,000 acre-feet limit for Las Animas. Of the water thus stored by these three Colorado canal companies 35% now goes into a Kansas transit loss account. Releases of stored water from the Kansas account are measured at the Stateline, and transit losses between John Martin Reservoir and the Stateline are made up from this Kansas transit loss account. Section III-D, Section II-E(4).

Under the 1980 plan, all winter flows are stored in John Martin Reservoir, and Colorado gives up its right to demand releases of 100 cfs during the winter season. Kansas also waives its compact right to divert summer river flows between 500 and 750 cfs. Summer inflow goes to the Colorado users in District 67 unless such flow exceeds their existing irrigation requirements by at least 1000 acre-feet. Under those circumstances, summer flow goes into conservation storage to be allocated among the various accounts.

B. Benefits Under the 1980 Operating Plan.

Evidence was introduced during the trial in an effort to quantify the benefits to Kansas under the plan, and to compare such amounts with estimated depletions. In the post-trial briefs, there is also considerable argument about which state benefitted more from the changed method of operating John Martin Reservoir. But I do not believe that such evidence and argument are useful, considering the way in which I have analyzed the issues raised by Colorado. The fact is that both states received significant benefits, and both states yielded certain rights otherwise available under the compact. RT Vol. 81 at 155-56; RT Vol. 66 at 54-55.

For Kansas, the 1980 plan guaranteed that it would receive 40% of the water stored in the conservation pool, and it allowed Kansas to call for water more nearly in accord with its crop demands. Under the common pool concept provided in the compact, to receive its fully allowable share, Kansas had to call for water whenever Colorado did, whether or not Kansas farmers then needed the water. There is evidence that in the early years Kansas did not always do so, and thus received less than 40%.

The 35% charge on water stored in John Martin by the three Colorado canal companies and the use of this water to establish a transit loss account also solved a long-standing and troublesome problem. Kansas' share of the river has always been determined at John Martin Reservoir, but measured in equivalent flow at the State-line some 58 miles downstream. Transit losses have long

been a problem. Colo. Exh. 21 at 133, 136-37; Colo. Exh. 17 at 55-59, 82. As a result of all of these changes, Colorado maintains that Kansas has received a larger percentage of water from John Martin Reservoir, and an increase in usable flows at the Stateline. Colo. Reply Br. at 5.

For Colorado, storage of water in their offstream reservoirs was most inefficient. A USGS paper indicates that only about half of the water diverted into storage entered the distribution system. Colo. Exh. 94 at 1. Helton described the Great Plains Reservoir System as "very inefficient." RT Vol. 81 at 125. By allowing Amity to store its Great Plains water in John Martin Reservoir, Bentrup testified that Amity "stood to gain a substantial windfall." Colo. Exh. 17 at 83. In fact, however, the savings were shared approximately equally with Kansas. Although the charge of 35% on stored water was a negotiated figure, the basis for that percentage lay in sharing the water gained by storing water in John Martin instead of in the Great Plains System. RT Vol. 81 at 136-37. In addition, each of the nine canal companies received its own separate account and no longer had to compete for released water, being able to call for it when most needed. Colorado users also received 24/35 (69%) of any excess waters left each year in the Kansas transit loss account. Fort Lyon and Las Animas were also permitted to store water from the Winter Water Storage Program in John Martin.

It is undisputed that the 1980 plan was beneficial to the water users in both states. Helton so testified, as did other witnesses. RT Vol. 81 at 155-56; RT Vol. 33 at 50-51, 104; Colo. Exh. 17 at 91-92. The 1980 plan was negotiated and evolved through several test years beginning in 1976

when Amity was first permitted to store in John Martin Reservoir. Jt. Exh. 21, Docs. 3, 4, 5, 7, 8, 9, 11. The negotiations were thorough, between parties of equal stature, with give and take by both states, and with several different approaches being taken during the test years.

C. Intent of the 1980 Operating Plan.

I do not find support for the Colorado argument that the benefits to Kansas under the 1980 plan should offset Stateline depletions caused by well pumping in Colorado. The plan itself indicates that it was intended to improve the efficiency of the operation of John Martin Reservoir. The recitals state that the then present operation of the conservation features of the reservoir did not result "in the most efficient utilization possible of the water under its control"; and the recitals include an administration finding that the plan may "result in more efficient utilization of water." There is nothing in the plan itself to indicate that it was intended to be used as an offset against compact violations, or as a solution to the impact of well pumping in Colorado.

I have also reviewed the record, specifically the numerous documents included in Joint Exhibit 21 that led to the development of the 1980 plan. These negotiations and various interim arrangements began in 1976, but there is nothing in the evidence that reflects the fact that the plan was intended to offset the impact of well pumping, or was a settlement of Kansas' well claims.

In its Closing Brief re Kansas' Well Claim, Colorado maintains that the 1980 plan was a practical solution devised "to address changes in the regime of the Arkansas River brought about by well development in both States." Page 19. In its Reply Brief at page 5, Colorado reiterates that the 1980 plan was a "fair and equitable solution to the problems caused by increased well development in both States." *Id.* at 22. However, Colorado provides no evidentiary citations to support these statements, nor do I find that this was the intent of the plan.

Kansas argues that the Colorado position would override Article IV-D of the compact, essentially allowing an administrative modification of the compact without the required consent of Congress. Colorado responds that the 1980 Operating Plan comes well within the authority of the Arkansas River Compact Administration under the compact; that Colorado does not contend that the compact can be lawfully altered without the consent of Congress; and that the issue is only whether Kansas' conduct may be considered in the attempted enforcement of an equitable right or remedy. However, these arguments go beyond what needs to be decided here since I do not believe there was any intent that accepting benefits under the 1980 plan would preclude any future well claim under the compact.

Colorado also states that both states realized that "the only feasible method to develop the unused waters of the Arkansas River below John Martin Dam was through additional well development." Colo. Closing Well Br. at 22. Colorado cites testimony by Helton to support this argument, but I believe its brief overstates

his testimony. Helton expressed only his own belief, not what "both States realized," adding, however, "that is what both States did," namely, to allow well development. RT Vol. 86 at 78-79; RT Vol. 115 at 64.

During oral argument on my Draft Report, Colorado presented a more limited argument with regard to the 1980 Operating Plan. No longer did it assert that approval of the Plan should bar *any* claim for well depletions after 1980, but rather that it "should mitigate damages to Kansas for the period after 1980." RT Vol. 143 at 41-43. In support of this position, Colorado placed heavy emphasis on the deposition of Carl Bentrup, a longtime Kansas representative to the Arkansas River Compact Administration. It is asserted that Bentrup believed that transit losses of water released from John Martin Reservoir were due at least in part to well pumping, and that his testimony "clearly establishes that the 1980 Operating Plan was intended to mitigate the impact of well pumping in Colorado." Colo. Oral Argument Memorandum at 46, 48.

There is no doubt that in the dry years of 1977 and 1978 transit losses between John Martin and the Stateline were a concern, but the evidence indicates that the problem lay primarily with surface diversions by the Colorado ditches, not with wells. Kansas' compact entitlement from John Martin Reservoir is to be "satisfied by an equivalent in Stateline flow." Article V-E(3). In Bentrup's view, if Kansas' water was not reaching the Stateline, the only way to rectify the situation was to "curtail Colorado ditches." Colo. Exh. 17 at 59. Indeed, Colorado's compliance efforts were directed at such surface diversions, not at well pumping.

In 1977 the ditch companies below John Martin by mutual agreement stored winter water in the reservoir, and voluntarily allowed conservation pool releases in the spring to run past their respective headgates for the first 24 hours. Kan. Exh. 462. In 1978 the Colorado Water Commissioner of Water District 67 issued an order to the same effect, but Amity Mutual then refused to comply. With the support of the compact administration, the Colorado State Engineer sought an injunction against Amity, but the water court dismissed his complaint. *Id.* The water court concluded that acting against only the ditch companies within District 67 was discriminatory; moreover, that prior action by the compact administration was required. Without ruling on these issues, the judgment of dismissal was affirmed on appeal. *People ex rel Danielson v. Amity Mutual Irrigation Co.*, 668 P.2d 1368 (Colo. 1983).

The 1980 Operating Plan was intended, in part, to deal with these transit loss problems, but the evidence does not support the view that it was also intended to mitigate compact violations from well pumping. Nor was any such claim made by Colorado when Kansas formally complained to the Arkansas River Compact Administration in 1985 about well pumping in Colorado.

D. Conclusions.

The 1980 Operating Plan provided benefits to both Kansas and Colorado which were separately bargained for. There is no evidence to support the claim that the benefits to Kansas were in settlement of its well claims. Colorado received ample consideration under the agreement for the 1980 plan without a waiver of Kansas' well

claims. The benefits received by Kansas under the plan should not be offset against compact violations, and should not be a bar to any of the Kansas claims in this case.

Colorado also states that Kansas should be barred from claiming that it is entitled to an accounting based upon demands for releases from John Martin Reservoir which are different from those called for under the plan. Colo. Closing Well Br. at 57. Once conservation storage has been released to Kansas in accordance with the plan, Colorado states that the remedy available to Kansas is limited to terminating the plan. Colo. Response Br. at 25-26. I am not aware that Kansas takes a contrary view of either of these statements. So long as the 1980 plan is not terminated or determined to be invalid, it is controlling on the releases from John Martin Reservoir.

SECTION XV

PRECOMPACT PUMPING ALLOWANCE

Both Kansas and Colorado acknowledge that some wells were in existence during the precompact years, and that pumping of groundwater did occur. Both states also agree that a certain amount of pumping should thus be allowable under the compact. However, the states are in major disagreement over the extent of this allowance. In fact, in terms of potential impact on Stateline flows, the amount of so-called "precompact" pumping is the largest quantitative issue in the case.

Kansas estimated that groundwater pumping in 1948 between Pueblo and the Stateline amounted to approximately 11,000 acre-feet. Kansas considers this to be the amount of pumping thus "grandfathered" under the compact and allowable in postcompact years. Over the 1950-85 period, Kansas estimated that total pumping by Colorado users amounted to 5,810,000 acre-feet. Kan. Exh. 731. Of this total, Kansas considered that 396,000 acre-feet (i.e., 11,000 acre-feet per year) represented allowable pumping under the compact. *Id.* Thus, in attempting to estimate impacts on Stateline flows resulting from postcompact pumping, the Kansas H-I model used the difference, namely 5,414,000 acre-feet over the 1950-85 period, as the measure of the alleged wrongful pumping. *Id.*

In contrast, Colorado estimated pumping for each of the years from 1940 through 1949 with annual amounts that varied from a high of 36,837 acre-feet to a low of 14,891 acre-feet. Colo. Exh. 165*, Table 9.8. However, in

determining allowable pumping under the compact, Colorado did not use the amount of water actually produced, but rather relied upon the claimed right of precompact wells to pump. Colorado determined which wells had precompact dates of appropriation, and for each postcompact year Colorado calculated allowable pumping by using a ratio based upon the decreed acreage of the precompact wells divided by the decreed acreage of all wells for each given year. Colo. Closing Well Br. at 63. Using this methodology, Colorado's calculation of allowable pumping by precompact wells averaged 49,275 acre-feet per year over the 1950-85 period, or a total of 1,774,000 acre-feet. Colo. Exh. 692 b*; Kan. Exh. 731. Colorado estimated total pumping by all wells for the 1950-85 period at 5,227,000 acre-feet. Subtracting the claimed allowance for precompact wells, the amount of pumping which Colorado used to determine Stateline impacts was 3,453,000 acre-feet for the 1950-85 period. *Id.* This would compare with the Kansas figure of 5,414,000 acre-feet.

At stake, therefore, is whether or not 1,378,000 acre-feet of postcompact pumping or some portion thereof will be considered as allowable under the compact. This amount is the difference between Kansas' allowance for precompact pumping of 396,000 acre-feet and Colorado's claim of 1,774,000 acre-feet for precompact wells. *Id.* Colorado's expert witness Dewayne Schroeder called this the major reason for the different estimates of Stateline depletions. RT Vol. 139 at 109.

A. Estimated Amounts of Actual Precompact Pumping.

Kansas estimated that more than 800 wells were in existence in 1948. One of its exhibits shows 849 wells, while its post-trial brief puts the number at approximately 880. Kan. Exh. 30, Table 2; Kan. Opening Br. at 11. The Colorado estimate for 1949 is 717 wells. Colo. Exh. 165*, Table A.1. Although Dr. Danielson testified that "numerous wells" existed in precompact times, he said they "weren't relied upon generally," and that reliance on wells was "not substantial." RT Vol. 76 at 35. This situation did not change until the "severe" drought in the 1950s and the corresponding development of the high capacity turbine pump and the availability of cheap energy. *Id*; Jt. Exh. 157 at 8.

By today's standards, the wells of 1940-48 appear fairly primitive. Dr. Danielson described them:

> "The Witness: Generally speaking, your Honor – and we have Mr. Longenbaugh who is a pump expert – but my experience is they were centrifugal pumps operated usually with electric motors, but oftentimes with a tractor backed up with a 90 degree gear head on it or something or large pits dug with the pump set down close enough to the water table that they could get a decent suction and then operated sometimes with a prime mover up on top or a power line up on top and huge belts running down into the pit. Generally speaking, centrifugal pumps of some sort. That isn't to say that there weren't any turbine pumps. I think there probably were, but the pumping was primarily by centrifugal lift pumps.

> Special Master: So the turbine pumps were developed primarily in the late 40's, early '50's?
>
> The Witness: At least that is where the major application began. The technology, I'm sure, was there prior, but the application would be really in that dry period in the '50's when the big surge in well development came." RT. Vol. 76 at 102.[62]

According to Danielson, these old centrifugals were generally replaced with the more efficient turbine pumps. RT Vol. 76 at 105.

Prior to the trial of this case, pumping for 1940-49 had been estimated in five separate hydrologic reports. None of these reports, however, estimated amounts that approached the yearly average of 25,228 acre-feet submitted by Colorado for use in the trial. Calculated from Colo. Exh. 165*, Table 9.8. The first of these earlier studies was the 1968 Wheeler Report prepared pursuant to Colorado legislation. The yearly average in that report was 10,600 acre-feet, ranging from 2300 in 1940 to 23,000 in 1949. Jt. Exh. 92 at 22. Then in 1970 the USGS issued the results of an intensive study that included similar figures, estimating 1940 at about 2000 acre-feet and increasing to 23,000 at the end of the decade. Jt. Exh. 66; Colo. Exh. 993.

In 1975 the Colorado state engineer's office published another report done under the supervision of Dr.

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[62] Helton also agreed that the older wells in existence in the 1930s and 1940s "were pretty inefficient, just big holes," and modern day wells didn't come into being until after World War II with the development of the turbine pump and cheap electricity. RT Vol. 82 at 136-37.

Danielson who was then the deputy state engineer. Jt. Exh. 94. This report was introduced into evidence on behalf of the state engineer during the trial of *Kuiper v. Atchison, Topeka & Santa Fe Ry. Co.*, and in support of his amended rules and regulations on pumping. (See Section XI(I) herein.) The report appears to have relied upon the USGS 1970 work, estimating the 1940-50 average at 12,600 acre-feet per year. Jt. Exh. 94 at 49. However, during this trial, Danielson testified that the annual pumpage figures in the report do not now seem to be reasonable, although he offered no corrections. RT Vol. 78 at 83-84.

In 1985 the USGS issued another report in which it repeated the pumping estimates published in its 1970 report. Jt. Exh. 129 at 10. Finally, in 1986, the United States Department of Agriculture in participation with the Colorado Water Conservation Board issued a report on the Arkansas River Basin which again included the early pumping estimates found in the 1970 USGS Report. Jt. Exh. 108 at I-11, A-15.

Determining the general level of precompact pumping is important if that is to be the measure of allowable pumping under the compact. It should be noted, however, that Colorado objects as a matter of law to the use of a single value for this purpose. Nonetheless, I find that 15,000 acre-feet per year is the most reasonable figure to represent pumping in precompact years. This is the highest amount estimated in each of the five reports for the years during which compact negotiations took place. Experts for both states also relied heavily on data from the 1970 USGS report (Basic-Data Release No. 21) in which this 15,000 acre-feet estimate appears. Moreover, Colorado called one of the authors of the Report as a

witness and he staunchly defended the accuracy of the USGS's pumping estimates. RT Vol. 129 at 61-62, 64. This was Thomas J. Major, a USGS employee from 1959 to 1985.

The Colorado Supreme Court stated that in 1940 only 2000 acre-feet were being pumped from wells in the Arkansas Valley. *Fellhauer v. People*, 167 Colo. 320, 447 P.2d 986 at 991 (1968). This 2000 acre-feet amount is in contrast to the figure of 36,837 calculated by Colorado for this trial. Colorado also used the USGS data (Basic-Data Release No. 21) in its 1975 report prepared for proceedings before the Water Court, and introduced into evidence. RT Vol. 76 at 88, 94; RT Vol. 77 at 35-36; Kan. Exh. 514 Vol. 1 at 5, 49-53, 145-52, 211-14. And from the Kansas viewpoint, its expert testified that while he thought 15,000 acre-feet was high, it was nonetheless reasonable. RT Vol. 125 at 60-61, 69.

Counsel for Colorado in his cross-examination of Kansas expert Dale E. Book did expose some inconsistencies in Joint Exhibit 94 which includes the 1940-49 pumping estimates published by the USGS in Basic-Data Release No. 21. The cross-examination concerned Table 7 in Joint Exhibit 94 which was prepared by the Colorado state engineer's office. It purports to show not only the total amount of water pumped for each year from 1940 through 1972, but also the amount of electric power associated with the pumping for each such year. The table states that the power data is taken from USGS Basic Data Release No. 21. However, those data do not appear in the USGS report, and no one seemed to know where they came from. RT Vol. 126 at 58; RT Vol. 130 at 49. Book agreed, however, that the relationship between the power

data and water consumption did not appear to be reasonable for some years. RT Vol. 126 at 58. Hal Simpson, the Colorado state engineer, was of the same opinion. RT Vol. 130 at 51. In comparing certain years, power consumption decreased while pumping increased.

However, the evidence is without dispute that the published power records for this early period were incomplete, and it may well be that it is the power data on Table 7 not the pumping estimates that are inaccurate. Virtually nothing is known about these power figures, but the pumpage estimates have been accepted, published and used by the State of Colorado, the courts, the U.S. Department of Agriculture, and the USGS, and in the case of USGS as late as 1985. Moreover, there is persuasive testimony by one of the authors of the Basic-Data Release No. 21 (where the pumping estimates but not the power consumption figures appear) as to the accuracy of that USGS publication.

As an alternate to this 15,000 acre-feet figure, Kansas estimated 1948 pumping to be approximately 11,000 acre-feet. Colorado argues that this figure is both unreasonable factually and wrong as a matter of law. Colo. Closing Well Br. at 60, 66. The year 1948 was wet, and I believe that Kansas' use of this single year is subject to the legitimate criticism that diversions were likely to have been high and pumping low. RT Vol. 82 at 133, 139; RT Vol. 84 at 17; RT Vol. 111 at 118, 120. The 15,000 acre-feet figure more likely reflects the general amount of Colorado's pumping that was affecting the flows of the Arkansas River at the time of the compact negotiations.

Colorado also developed pumping estimates for the 1940-49 period for use in this trial. Its annual average was 25,228 acre-feet, but I have some concern about these higher numbers. During oral argument on my Draft Report, Colorado sought an even larger amount, on the order of 36,000 acre-feet annually. Both states relied upon power consumption records as the basis for calculating pumping. However, because the early data were incomplete, Book testified that something over half of Colorado's estimated power usage during the precompact years came not from actual data but through regression analyses. RT Vol. 125 at 57. For 1940-45 these analyses depended upon a single data point taken from the Pueblo office of CENTEL, and the amounts of Las Animas energy were correlated to SECPA values which themselves had been estimated. RT Vol. 71 at 56-60, 91. Colorado's pumping figures also included adjustments for pumping by nonelectric wells, and for pump efficiencies.

In making these adjustments, Colorado extrapolated backward in time from the 1964-68 well data collected by the USGS and published in Basic-Data Release No. 21. RT Vol. 125 at 49. As a result, Colorado assumed that nonelectric pumping increased going back in time as a percentage of total pumping. RT Vol. 126 at 56. Moreover, its analysis assumed that the older pumps in the 1940s were more efficient, and hence pumped larger quantities of water for any given amount of power consumption. RT Vol. 72 at 6-7; RT Vol. 125 at 58; RT Vol. 126 at 36-37, 43. However, it appears that the Colorado analysis did not take into account the replacement of centrifugal pumps with the more efficient turbine pumps that occurred in the late 1940s and early 1950s.

For whatever reason, the result of the Colorado approach is to make pumping in 1940 the highest amount in the whole decade of the 1940s.[63] This result seems questionable in light of all the earlier studies showing increasing pumping throughout the 1940s, and the new wells which continued to be drilled throughout the decade. Colorado's own report puts the number of additional wells drilled between 1941 and 1949 at 122. Jt. Exh. 94 at 19. A lower rather than higher estimate of early 1940s pumping is also supported by the fact that during the compact negotiations the engineering committee made no effort to include pumping as part of the diversion data, or indeed at all. Jt. Exh. 5 at 3. The historic division of flow between the two states was considered on the basis of surface diversions alone.

B. Colorado's Theory of the Entitlement of Precompact Wells.

While Colorado did introduce protective evidence on the amounts of precompact pumping, Colorado rejects the idea of using any single value to represent the amount of pumping that is allowable under the compact. Instead, Colorado argues that postcompact pumping by precompact wells will vary from year to year depending upon the crops grown, hydrologic conditions, and the amount of surface water available. Colo. Closing Well Br. at 62. Precompact wells, according to Colorado, should be allowed to pump in the later years the amount of water

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[63] It is generally acknowledged that 1940 was a very dry year. Jt. Exh. 5, Tables 1-7; RT Vol. 126 at 67.

needed to supply "unmet demand" and permitted under Colorado law. RT Vol. 114 at 30, 32. Such unmet demand was based on sufficient water for optimum crop production. RT Vol. 70 at 40. In order to quantify such amounts, Mr. Helton testified to a "decreed acreage" approach which was based upon his understanding of the entitlement of these wells under Colorado law. Colo. Reply Br. at 31.

Colorado first identified the wells with precompact dates of appropriation. These were considered to be wells that existed on May 31, 1949. RT Vol. 84 at 20. It should be noted that such appropriation dates were not decreed until sometime after 1969. It was not until the 1969 legislation in Colorado that all wells were required to be registered, and a procedure was established to determine retroactively the appropriation dates based upon the dates when the wells began to pump, and also to determine the acreage irrigated.[64] The precompact amount of decreed acreage in the Colorado analysis is thus a fixed figure. RT Vol. 82 at 139. It is 43,724 acres. RT Vol. 83 at 7.

In each year in the 1950-85 period, Helton testified that Colorado's experts then determined the total amount of pumping, and the total amount of decreed acreage associated with such pumping. Next, Colorado calculated a ratio for each year based on the decreed acreage of the

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[64] These were largely uncontested proceedings, and Colorado acknowledges that not all of the data may have been accurate. Colo. Response Br. at 72. However, it is not necessary to consider this issue further since I conclude that Colorado's reliance on these decrees to establish the amount of pumping allowed under the compact was not proper as a matter of law.

precompact wells divided by the total decreed acreage of all wells, and applied that fraction to the total amount of pumping for the year. RT Vol. 82 at 139; RT Vol. 84 at 14-16. In Helton's opinion this decreed acreage approach was the best way to estimate the volume of water pumped that was associated with precompact wells. RT Vol. 84 at 16. While the amount of such pumping varied year by year, the annual average for 1950-85 was 49,275 acre-feet. RT Vol. 82 at 136; RT Vol. 133 at 54; Colo. Exh. 135* at 1.1. This compares with average postcompact pumping by all wells of 145,199 acre-feet per year, as estimated by Colorado. Since 1976, the total decreed acreage for such wells has been in the order of 171,000 acres. Colo. Exh. 165*, Table A.1. In analyzing the impact of postcompact pumping on Stateline flows, Colorado then used the difference between these pumping amounts (49,275 and 145,199 on average), namely, an average of 95,925 acre-feet per year. Colo. Exh. 135* at 1.1. Of course, the impact was actually determined on an annual basis, and those amounts were then totalled.

Colorado's legal rationale for this approach is based first on Article VI-A(2) of the compact. It reads:

> "(2) Except as otherwise provided, nothing in this Compact shall be construed as supplanting the administration by Colorado of the rights of appropriators of waters of the Arkansas River in said State as decreed to said appropriators by the courts of Colorado, nor as interfering with the distribution among said appropriators by Colorado, nor as curtailing the diversion and use for irrigation and other beneficial purposes in Colorado of the waters of the Arkansas River."

Moreover, Colorado argues:

> "Article IV-D of the Arkansas River Compact imposed limits on future development and construction in both States, but not on existing development. The Kansas Commissioners who negotiated the Compact undoubtedly understood that pumping by wells in Colorado with precompact dates of appropriation would vary from year to year for the same reasons that diversions by surface ditches vary from year to year. They also undoubtedly understood that wells which were drilled before the Compact was approved, but became fully operational after the date of the adoption of the Compact would relate back to the date of the appropriation, because that had long been Colorado law." Colo. Response Br. at 71.

I believe there are several fallacies in Colorado's theory. I disagree with the Colorado argument that the rights of the precompact well appropriators, as decreed by the Colorado courts, are "binding on Kansas." Colo. Response Br. at 73. See *Hinderlider v. La Plata River & Cherry Creek Ditch Co.*, 304 U.S. 92, 102, 82 L.Ed. 1202, 58 S.Ct. 803 (1938); *Texas v. New Mexico*, 462 U.S. 554, 564, 77 L.Ed.2d 1, 103 S.Ct. 2558 (1983); *Frontier Ditch Co. v. Southeastern Colorado Water Conservancy District*, 761 P.2d 1117, 1123-24 (Colo. 1988). First, Article VI-A(2) does not render Kansas' Stateline entitlement subordinate to whatever appropriative rights may be decreed by Colorado courts. The Article begins with the phrase, "Except as otherwise provided," and must be read in conjunction with Article IV-D. I conclude that Article VI-A(2) was not

meant to override the obligations of Colorado under Article IV-D. The compact was intended, *inter alia*, to maintain in the future the general allocation of the natural river flows between the states that had existed in precompact years. Article IV-D was the primary means of accomplishing this result by preventing additional depletions. It applies not only to new construction but also precludes the "improved or prolonged functioning of existing works" if such development would cause a material depletion of usable Stateline flows. I find that new wells, the replacement of centrifugal with turbine pumps, and increased pumping from precompact wells all come within this provision. The compact negotiators did not intend to permit water use in either state to be increased at the expense of the other.

Second, it should be noted that the compact specifically provides that the ditch diversion rights within Colorado Water District 67 and in Kansas between the Stateline and Garden City shall not be "increased beyond the total present rights of said ditches" unless the compact administration finds that such increase would not result in a material depletion of usable flows. Article V-H. At the time the compact was negotiated, Colorado had no system for establishing the "rights" of wells. However, I cannot believe that the compact was intended to limit increased surface diversion rights, but to allow new rights to be later established for wells that would change the river allocation between the states.

Third, I disagree with Colorado about what the Kansas commissioners who negotiated the compact "undoubtedly understood." Indeed, I do not believe that

any of the commissioners, either from Colorado or Kansas, had in mind the development of the deep turbine pump or the possibility of such a dramatic increase in pumping. The controlling factor here is the language of the compact and the intent of the compact negotiators, a fact that Colorado acknowledges. Colo. Response Br. at 71, fn. 18. Pumping at the time was so insignificant that it did not even enter the discussions. But the relative allocation of water between the states, based on usage over recent times, did lie at the heart of the negotiations. The compact was intended to protect and maintain that general allocation – and to divide the new benefits of John Martin Reservoir storage. The Colorado legal theory and evidentiary approach would upset that allocation by some 1.7 million acre-feet over the 1950-85 period. I conclude that no such result was intended.

Following the issuance of my Draft Report, Colorado argued that if a single figure is to be used to represent precompact pumping, then the USGS estimate of 15,000 acre-feet is too low. Colorado asked that the amount of allowable precompact pumping be reconsidered. Colorado maintained: (1) that the 15,000 acre-feet amount was limited to pumping from the valley-fill aquifer only, and did not include pumping from the surficial aquifer; (2) that it also omitted irrigation wells with a capacity of less than 100 gpm; (3) and, finally, that climatic conditions during the precompact years were wetter than in later years, with the result that precompact pumping was less than normal. For this reason Colorado sought an upward pumping adjustment of 15 percent.

Colorado argued that including pumping from the surficial aquifer would increase the estimate by 5,180

acre-feet.[65] Adding wells under 100 gpm involved another 6.1 percent, according to Colorado, bringing the total to 21,400 acre-feet of pumping in 1948. Colo. Oral Argument Memorandum at 25. These adjustments alone would increase the total amount of "grandfathered" pumping by 238,000 acre-feet. However, in Colorado's view these figures were still low. Based on the calculations of its experts,[66] Colorado argued that the precompact pumping figure should be "at least 31,500 acre-feet." *Id.* at 26-27. When adjusted by 15 percent for climatic conditions, the full Colorado claim comes to just over 36,000 acre-feet. *Id.*

The first issue is whether the 15,000 acre-feet figure omitted pumping from the surficial aquifer. Counsel for Colorado stated that the "great bulk" of the surficial wells were located in the Bessemer service area, and it was "absolutely clear" that the area was excluded from the USGS 1964-68 study area. RT Vol. 143 at 17, 39. It does, indeed, appear that the intensive field work carried

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[65] This amount is based on 29.1 acre-feet per well for 178 wells, that is, the number of wells shown in the Colorado data base for 1948. Colo. Oral Argument Memorandum at 24. The 29.1 acre-feet number is the result of dividing 515 wells in the valley-fill aquifer into 15,000 acre-feet. Colorado's calculations assume that production from the surficial aquifer is at the same rate as from the valley-fill, although the evidence generally was to the contrary. See, e.g., Colo. Exh. 165*, Tables A.2, A.3.

[66] Colorado's experts estimated that during the 1940s large-capacity irrigation wells produced on average 41.3 acre-feet. This amount was multiplied by 717 wells, taken from Colorado's well data base in 1949, and then increased by 6.1 percent to include wells under 100 gpm. Colo. Oral Argument Memorandum at 26-27.

on by the USGS in 1964-68 was limited to irrigation wells of 100 gpm or more located in the valley-fill aquifer. That is what the text of the report states, and Kansas has not disputed the study area for those years. Jt. Exh. 66 at 1, 10 (Table 2); Kan. Supplemental Comments at 13. But that is not to say that the pumping estimates for the earlier years, namely 1940-63, were collected for the same area. Nor is the USGS study (Joint Exhibit 66) the only report that must be considered.

In 1968 the Wheeler Report, done at the request of the Colorado legislature, was published. Pumping estimates in the Wheeler Report for the 1940s are close, but not identical, to the USGS figures for the same period of time. Jt. Exh. 92 at 22; Jt. Exh. 94, Table 7 at 22. Pumping in 1940, according to Wheeler, was put at 2,300 acre-feet; increasing to 15,000 acre-feet during the years (1946-48) when the compact was being negotiated; and averaging 10,600 acre-feet for the 1940-49 period. *Id.* Significantly, however, the Wheeler Report *does* include the wells located on the Bessemer Terrace, that is, in the surficial aquifer. Jt. Exh. 92 at A-10. For the Bessemer Canal, the Wheeler Report lists 301 wells in the Bessemer Terrace and 47 in the alluvium. Moreover, the well data for 1940-65 was said to have been obtained from the Colorado Water Conservation District, based on maps plotted from the USGS study. *Id.* at 22-23.

No one is sure how the pumping estimates before 1963 were reached. RT Vol. 133 at 49. Yet it is clear that the only power records available for that period were based on utility service areas. Colo. Exh. 165*, Table 2.1. There were no distinctions in the power records between electricity supplied to wells located in the valley fill

aquifer and those in the surficial aquifer. Nor do later reports referring to or incorporating the USGS early pumping estimates indicate that they were limited to the valley fill aquifer.[67]

In short, I find that the evidence does not support the Colorado claim that pumping from the surficial aquifer was omitted from the precompact estimates, requiring an increase in the 15,000 acre-feet figure used in this Report.

Nor am I persuaded that the precompact pumping estimate should be increased to account for small-capacity irrigation wells, or for climatic conditions. Colorado's claim for a 6.1 percent increase for small capacity wells is based on the argument that for 1964-68 the Kansas pumping estimates exceeded those of the USGS by 6.1 percent. Colo. Oral Argument Memorandum at 24-25. Admittedly, the Kansas figures included wells of 50 gpm capacity, while for those years the USGS inventoried only wells of 100 gpm or more. But there is no evidence that the difference in pumping estimates can be attributed to the differences in well capacities. Indeed, for all but one of the years *before* 1964, the Kansas pumping estimates prepared for this trial were less than the USGS figures. Colo.

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[67] Jt. Exh. 92 at 22 refers to 1940-65 pumping from the "Arkansas Valley." Jt. Exh. 94 speaks of wells "tapping the alluvium of the Arkansas River Valley," and lists wells "Drilled Annually – Arkansas River," (1940-72) at 17, 19. The 1985 USGS Report incorporates the earlier BDR 21 data as estimates of pumping "ground water in the Arkansas Valley," and refers to problems caused by withdrawals "from alluvial aquifers." Jt. Exh. 129 at 9.

Exh. 993. Nor did I adopt the Kansas estimates to establish a precompact pumping allowance.

With respect to any climate adjustment, it certainly is true that pumping may vary depending upon the weather and the amount of river flow available for surface diversions. However, the conclusion that precompact pumping, except for some wet years, would have been 15 percent greater is highly speculative.

Finally, Colorado attempted during oral argument on the Draft Report to justify a higher precompact pumping allowance by making various comparisons of the amounts of water pumped per well. This effort included comparisons with precompact wells in Kansas, and also a comparison of the average pumping per well in Colorado as calculated by Kansas for the 1950s and 1960s. However, the foundation is simply insufficient to make meaningful comparisons of this kind. Arithmetical averages alone are not useful without evidence to analyze the shift from centrifugal to vertical turbine pumps, without considering the changing distribution between electric and nonelectric wells, and without knowing the different geologic conditions that affect well productivity.

There is no precise answer to the amount of precompact pumping, or even as to the particular years that should be considered in making a compact allowance. That amount must simply remain as an estimate of water use that affected the general allocation of water between the states when the compact was being negotiated. Two responsible reports, one published by the USGS and one prepared for the Colorado legislature, reached similar

conclusions as to the amounts of Colorado pumping during the 1940s. These reports were done much closer to the time period involved, and without the pressure of trial advocacy. They have since been used by the Colorado State Engineer. I have relied on these reports and recommend that the highest annual amount shown to have been pumped during the negotiations, namely 15,000 acre-feet, should be allowed under the compact.

SECTION XVI

POSTCOMPACT PUMPING IN COLORADO

Establishing the total amount of water pumped by wells along the Arkansas River during the postcompact years is one of the major issues in the case. It is not a matter easily resolved. Colorado generally does not require meters on wells, and has had no comprehensive system calling for reports of the amounts of water pumped. RT Vol. 65 at 78-79; RT Vol. 67 at 114-16. Colorado State Engineer Simpson did testify, however, that he is now requiring the two major well organizations in the Arkansas River Valley to measure power coefficients and to estimate pumping based on power records. RT Vol. 130 at 52-53. The Water Court decrees establishing appropriative rights for wells do so in terms of a rate of flow (cfs), and do not limit the quantity of water that may be pumped, although the permitted acreage may be restricted. RT Vol. 65 at 75. It was necessary, therefore, for both states to develop their own pumping estimates for the postcompact period, that is, from 1950 to 1985.

Pumping estimates are sometimes made through the consumptive-use method, which is based upon crop demand, irrigation efficiency, effective precipitation, and surface water supply. However, these variables are not commonly measured or known with much accuracy. Another recognized method, which in fact was used in this case, is based upon energy consumption. This system requires data on the amount of energy supplied to the

well, and the development of a "power coefficient."[68] This factor is the amount of power required to pump a unit volume of water. Estimates from this methodology can be quite reliable if the basic data are complete. However, as might be expected in any effort to reconstruct pumping as far back as 1950, problems exist with the data. The efforts made by the experts for both states were indeed commendable, and their results differed by only about 10%.[69] However, that percentage difference still amounts to a considerable amount of water over the full postcompact period.

A. Kansas' Estimate of Pumping.

Kansas estimates that pumping along the Arkansas River in Colorado between Pueblo and the Stateline, over the 1950-85 period, amounted to 5,810,000 acre-feet. Kan. Exh. 731.[70] This amount includes wells located in both the valley fill and bench aquifers. It is limited to irrigation wells, and does not include municipal or industrial pumping. Average annual pumping over the 36-year

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[68] Sometimes described also as the "power consumption coefficient," or "power conversion factor," or "energy consumption factor."

[69] Dale E. Book of Spronk Water Engineers, Inc. did the work for Kansas. Colorado used Boyle Engineering Corporation, and James E. Slattery was the principal author of Boyle's report on pumping. Colo. Exh. 165*.

[70] In an earlier exhibit, Kansas originally estimated total pumping at 5,934,370 acre-feet. Kan. Exh. 32. However, the 5.81 million acre-feet (MAF) figure is the amount used by Kansas in its revised H-I model.

postcompact period amounted to 161,394 acre-feet. Kan. Exhs. 689, 731.

B. Colorado's Estimate of Pumping.

Colorado's estimate of total pumping over the 1950-85 period is 5,227,000 acre-feet. Kan. Exh. 731. The annual average is 145,200. Colo. Exh. 852. Colorado's estimate was also limited to irrigation wells, but only for those located in the greater of the ditch service areas or the valley fill aquifer. Colo. Exh. 165* at 1. The difference between the total pumping estimates of the two states over the 1950-85 period is 580,000 acre-feet.

C. Estimates of the Number of Wells.

The states also differ on the number of wells. Kansas inventoried wells with a capacity of more than 50 gallons per minute (gpm), and found that the total number of such wells in Colorado in 1985 was 2,543. Colo. Exh. 851. Colorado, on the other hand, used 100 gpm as its criterion for an irrigation well in order to coincide with the definition used by the USGS in its Basic-Data Release No. 21 (BDR No. 21). Jt. Exh. 66. Colorado's total for number of wells was 2057. Colo. Exh. 851. This total by Colorado represents permitted and decreed wells, which is not necessarily the same as the number of active wells located physically on the ground. RT Vol. 129 at 41-42. Finally, Kansas included wells located in the bench aquifers as well as those in the valley fill, while Colorado confined its analysis to a more limited "mainstem" area.

The difference, however, in the total number of wells reported by the two states is not significant for the purpose of estimating total pumping. Colorado prepared a comprehensive comparison of the wells located in the valley fill aquifer, which is where most of the wells are located. The comparison was limited to wells of 100 gpm or more. Colo. Exhs. 403a*-c*, 788; RT Vol. 68 at 63. Using this common basis, Colorado concluded that Kansas listed 137 wells that Colorado did not include, and that Colorado listed 93 wells not shown by Kansas. Colo. Exh. 788. The net difference was 44 wells, with a total of 1717 wells being identified by Kansas and 1673 by Colorado. Book agreed that this exhibit was correct. RT Vol. 125 at 35.

Simpson testified there were roughly 50 more alluvial wells under 100 gpm that could be added to the difference. RT Vol. 68 at 66. However, Colorado did not believe that these smaller wells were significant. At most a well of such size can irrigate only 4 or 5 acres. RT Vol. 68 at 73. According to the Colorado analysis, which appears to be carefully done and reliable, Colorado's slightly smaller number of wells is due primarily to the following factors: a Colorado field survey that found that certain wells listed by Kansas were not in fact used; the fact that some of the Kansas wells were duplicated in its computations; and the fact that Kansas included some old wells constructed before 1957 which had never been adjudicated. Colorado in its inventory assumed that these unadjudicated wells had been abandoned or were not in use. RT Vol. 68 at 66-67. On the other hand, Colorado listed 81 adjudicated wells that Kansas did not show. RT Vol. 68 at 71. In short, the difference in the total number of wells is

not as large as it first appears, but of more importance, both Book and Slattery agreed that the difference is not significant considering how the data were used. RT Vol. 125 at 36; RT Vol. 70 at 59-60.

D. Common Methodology Used by the States.

Both states generally use the same methodology in order to estimate total pumping. The first step is to assemble the records of electric power consumed for irrigation purposes in the Arkansas River Valley. A number of utilities supplied such power: Southeast Colorado Power Association (SECPA), Southern Colorado Power Company (CENTEL), Lamar Light and Power, Las Animas Municipal Light and Power, the Town of Holly. Records of the Colorado Public Utilities Commission were examined, and Colorado also utilized records from Colorado State University. Power used to supply "lift pumps" is subtracted from these data. A lift pump is not used to extract water from a well, but typically is a "ditch pump" lifting water from a canal to a higher elevation.

Two of these power companies, SECPA and CENTEL, also served electricity for irrigation purposes outside of the Arkansas River Valley. It was necessary therefore to segregate from total energy deliveries the amount of power used by wells along the Arkansas River within the respective study areas of the states. The distribution of SECPA power is in substantial dispute. Both states then applied power coefficients, or power conversion factors, to translate kilowatt hours into acre-feet pumped. For this purpose, both states relied upon power coefficients developed by the USGS during its 1964-68 study, BDR No. 21.

Jt. Exh. 66. In that study the USGS identified 1348 large irrigation wells (over 100 gpm) located in the valley fill aquifer. Data on well location, depth of well, depth to water, discharge rate, and the power source (electricity or gas) were collected for most of these wells. In addition, spring and fall water level measurements were taken over the 1964-68 period, and the electric and gas meters on the wells were read at the same time. *Id.* at 2, 4.

A power coefficient is dependent upon a number of factors, including pump and motor efficiency, well head discharge pressure, and the pump lift (number of feet between the groundwater level and the surface of the ground). Both states made adjustments to the power coefficients for changes over time in the groundwater levels, but only Colorado made a further adjustment for pump efficiencies. RT Vol. 69 at 70-71, 115, 122.

Lastly, both states made adjustments for pumping by nonelectric wells. There were no records available of fuel used, such as natural gas, to drive the pumps on nonelectric wells. However, in its 1964-68 study the USGS did inventory the nonelectric wells. This inventory is considered to be reliable for the 1964-68 period. Colo. Exh. 165* at 12.

In comparing the pumping estimates of the two states, the most significant differences result from: the allocation of Southeast Colorado Power Association energy to the study area along the Arkansas River; the adjustments made by Colorado to the power coefficients for pump efficiencies; and the amounts of extractions assigned to nonelectric pumping. Each of these differences is now discussed.

E. The Allocation of Southeast Colorado Power Association (SECPA) Energy.

In the SECPA service area, computerized section-by-section records were available for the period 1977-1985. These data were used by the experts for both states to allocate power to their respective study areas, and the resulting pumping estimates during this period were quite similar. The differences arise during the years 1950-76. During this period of time, the opposing methods of allocation of SECPA energy to the mainstem area account for an average pumping difference of 12,474 acre-feet per year. Colo. Exh. 822 at 2. Spread over the entire 1950-85 period, Colorado attributes an average of 9356 acre-feet per year of the total pumping difference to the SECPA issue. Colo. Exh. 822, Table 1.0.

Complete ledger billing sheets from SECPA were available for the years 1953-60 and 1973-74, but were incomplete during the intervening years. These ledger sheets contained the data used for customer billing, including meter readings and the locations of meters. Kan. Exh. 627. For the years when the ledger sheets were complete, Kansas relied upon them directly to make the necessary allocation of SECPA energy. For the 1961-72 period, when complete ledger sheets were not available, Kansas estimated the portion of total irrigation energy supplied to the mainstem area based on percentages of the total power for the periods prior and subsequent to 1961-72. Colo. Exh. 660 at 5.

Colorado agrees that these ledger sheets, if they could be accurately interpreted, "would provide a better

basis to allocate power in the SECPA service area to the mainstem area than the percentages used by Mr. Slattery," Colorado's expert. Colo. Response Br. at 81. However, Colorado maintains that the ledger sheets required too much interpretation to be reliable, and therefore used none of them. RT Vol. 70 at 17; RT Vol. 72 at 109-13. Instead, Colorado allocated SECPA energy for 1968-77 essentially on the basis of a straight line interpolation between the values used by the USGS in its 1964-68 study and SECPA's computerized records that became available in 1977. In the years before 1964 for which it did not have records, Colorado relied upon correlations that it developed with other electric suppliers. Power records generally were incomplete for the 1940-60 period, and missing records were estimated using regression techniques. Colo. Exh. 165* at 3. Because of the deficiencies in its power data, Colorado's expert testified that his pumping estimates for the years prior to 1960 had a range of uncertainty of "probably about plus or minus 20 percent." RT Vol. 69 at 94.

The dispute over allocating SECPA energy resulted in very large differences in the annual pumping estimates from 1971 through 1976, ranging from 21,163 acre-feet to 60,247 acre-feet. Colo. Exh. 822, Table 1.0. In each instance the Colorado estimate was lower. The largest difference of 60,247 acre-feet occurs in 1974 when complete ledger sheets were available and were used by Kansas but not by Colorado. The SECPA issue largely turns on a question of whether these ledger sheets were more reliable than the interpolations and correlations utilized by Colorado.

Colorado's expert Slattery testified that use of the ledger sheets involved "a great deal of interpretation"

and the possibility of error made them an unreliable source of data. RT Vol. 71 at 139; RT Vol. 70 at 17. Slattery also added, however, that the ledger sheets were not used because of "the level of effort of digitizing that large of a data base." RT Vol. 70 at 17. Kansas had offered one of the ledger sheets in evidence as an example. Kan. Exh. 627. Slattery acknowledged that this particular sample was simple to read, but said that it was an exception. RT Vol. 72 at 30, 103, 113. Slattery then produced another ledger sheet that he claimed was more difficult to read and would be more typical of the type that was generally available. Colo. Exh. 811; RT Vol. 72 at 113. Slattery testified that this example was subject to a series of different interpretations, and was "very confusing" to him. RT Vol. 72 at 110.

With the acquiescence of counsel, I called Kansas' expert witness Book back to the stand, without warning, to see if he could read this ledger sheet. RT Vol. 72 at 114. Book showed no hesitation, and had no difficulty in extracting all of the pertinent information from the ledger sheet. RT Vol. 72 at 133-41. Interpretation of the sheets, he acknowledged, required care but posed no problem. RT Vol. 72 at 137.

For the years 1957 and 1958 the amount of energy allocated to the mainstem area by Kansas on the basis of summing up all of the ledger sheets slightly exceeded the total amount of power reported to have been supplied by SECPA. RT Vol. 70 at 12; Colo. Exh. 660, Table 1A. The reported total company production came from records filed with Colorado State University, under a voluntary program. RT Vol. 62 at 40-41; RT Vol. 72 at 38-39. Colorado cites this inconsistency as another reason why the

ledger sheets could not be used reliably. Colo. Response Br. at 81-82. Indeed, because of these two years Slattery concluded that the ledger sheets overestimated power for all the years. This argument assumes, however, that the Colorado State University records for those two years were more accurate than Kansas' interpretation of the ledger sheets. There was no evidence establishing the accuracy or completeness of the reports filed with the university, while we do know that the ledger sheets were used to bill customers for the amounts of power shown.

In the years 1973 and 1974, which were far more important to the pumping estimates than 1957-58, Kansas' summation of the ledger sheets allocated 75% and 74%, respectively, of the company's total power sales to the mainstem area. Colo. Response Br. at 82. These percentages compare favorably to Slattery's testimony that over all the years about 80% of the SECPA energy was delivered to the mainstem area. RT Vol. 72 at 96. In contrast, the Colorado allocation to the mainstem area for 1974 was only 44%. RT Vol. 72 at 49.

Colorado relies heavily on the USGS 1964-68 study. Jt. Exh. 66. One of the authors of that study testified that the USGS also used individual ledger sheets obtained from the power companies, that he considered them to be as accurate as any information one could get, and that they were "very clear," not difficult to read or understand. RT Vol. 129 at 26, 36.

I find that the ledger sheets provide the best source of data available for allocating the amount of SECPA energy delivered to the study area along the Arkansas River, and that such data can be reliably used. I find

further that Kansas' allocation of SECPA energy, based upon the use of the ledger sheets, provides the most reliable estimate of power supplied to the study area, and should be used in determining the amount of pumping in that area.

F. Pumping from Nonelectric Wells.

While the large majority of pumps in the Arkansas Valley have been operated with electrical energy, a considerable amount of water has also been produced using nonelectric pumps, that is, pumps driven by natural gas, diesel or gasoline fuels. The differences between the states in estimating the amount of such nonelectric pumping average 4511 acre-feet annually over the 1950-85 period. Colo. Exh. 822 at 3. Kansas' estimate is higher considering the whole postcompact period, although in the earlier years Colorado estimated higher amounts of nonelectric pumping. Virtually no data are available on the amounts of energy supplied to nonelectric wells over the 1950-85 period.

The only comprehensive study of nonelectric wells was made by the USGS as part of its 1964-68 investigation. The USGS not only inventoried the various kinds of nonelectric wells, but also assembled data from which pumping estimates from these wells could be made. Of 1342 active wells for which the power source was reported, the USGS found 1136 electric wells and 206 nonelectric wells. Colo. Exh. 165*, Table 7.1. The nonelectric wells were further divided into 62 natural gas wells and 144 diesel or gasoline wells. In all, they comprised about 18% of the wells studied.

Kansas used microfilm data for the year 1968 taken from that USGS study to determine the ratio of electric to nonelectric pumping for 1968. RT Vol. 126 at 48. The Kansas experts then applied that same ratio to later years, but subject to a "cap." The cap actually amounted to 26,900 acre-feet annually, which was the amount of nonelectric pumping calculated by Kansas for 1968. Kan. Exh. 689 at 3. The use of the cap stabilized nonelectric pumping at 26,900 acre-feet for each year from 1971 through 1982. Colo. Exh. 822, Table 4.0. For the years 1983-85, the amount was slightly less. The Kansas approach thus limited any increase in nonelectric pumping during the dry years of the 1970s, but it did not take into account evidence that the number of nonelectric wells decreased over the years.

Colorado, in making its estimates of nonelectric pumping, relied not only upon the 1964-68 USGS data, but also upon several localized studies, and upon the experience of two irrigation experts who had worked in the Arkansas Valley for many years. Two of these localized inventories of nonelectric wells were made in the 1940s. Colo. Exh. 165*, Table 7.1. A more comprehensive inventory was made by the Colorado state engineer in 1985. Of 887 wells included in the 1985 report, 825 were electric and 62 or about 6% were nonelectric (58 natural gas wells and 4 diesel wells). *Id.* In 1991 the Colorado state engineer's office also completed a field investigation of a limited number of wells located downstream from John Martin Reservoir under the Buffalo Canal, and located south of the river in the area served only by wells. RT Vol. 68 at 76-77; RT Vol. 126 at 50. Between 40 and 50 wells were included in this survey.

Within the Buffalo Canal service area 14.5% of the wells were nonelectric, and in the area south of the river the figure was 9.5%. RT Vol. 68 at 76; RT Vol. 126 at 45-46.

Unlike Kansas, Colorado based its estimates of nonelectric pumping upon a declining ratio of nonelectric to electric pumping over time. There is substantial evidence in the record, uncontroverted by Kansas, that the number of nonelectric wells has decreased over time. Besides the several inventories noted above, this conclusion is firmly supported by the testimony of Robert A. Longenbaugh and Donald L. Miles. Mr. Longenbaugh has been employed by the Colorado Division of Water Resources since 1981, and when he testified was an assistant state engineer. Prior to 1981 he was with Colorado State University for 19 years, serving as an Extension Irrigation Specialist and an Associate Professor in civil engineering. He was responsible for maintaining an observation well network of approximately 1200 wells in Colorado, begun by CSU in 1929; he worked on many projects involving irrigation and pump efficiencies along the Arkansas River; and he coauthored a textbook chapter on farm pumps. Kan. Exh. 624.

Until his retirement in 1988, Mr. Miles worked for more than 20 years with the Cooperative Extension Service associated with Colorado State University, and for some 15 years was stationed at Rocky Ford on the Arkansas River. Moreover, he grew up on a farm under the Fort Lyon Canal. He published a wide range of research reports and articles, and worked closely with farmers helping them to make management decisions.

Both Miles and Longenbaugh had years of personal experience as irrigation experts assisting farmers along the Arkansas River.

Longenbaugh and Miles testified that natural gas prices rose significantly in the early 1970s because of the Arab oil embargo. RT Vol. 63 at 199; RT Vol. 65 at 151. Moreover, there were problems with the BTU rating of natural gas, and SECPA seized the moment to launch a heavy promotional effort to get farmers to convert to electricity. RT Vol. 65 at 151-52. As a result, there was a conversion from fossil fuel energy to electricity. Miles testified that at the present time about 97% of the wells valley-wide are electric. *Id.* The percentage would be a little lower downstream of John Martin Reservoir, where the bulk of the nonelectric wells are located. *Id.* Book also acknowledged that both natural gas and diesel prices had increased in the early 1970s, and indeed that some conversion to electricity had occurred. RT Vol. 23 at 107. The increase in the amount of SECPA power sold during this period of time may also suggest a significant conversion to electricity, although to some extent it may reflect increased pumping during the dry years. In 1973 SECPA sales along the Arkansas River were 6.7 million kWh. By 1976 this amount had increased to 18.1 million kWh. RT Vol. 23 at 109.

There is a good deal of uncertainty in the estimates of nonelectric pumping provided by both states. However, I find that the Colorado methodology more accurately accounts for the reduction in the number of nonelectric wells, which I believe did occur. Accordingly, the Kansas estimates for total pumping should be adjusted to reflect

the nonelectric pumping estimates calculated by Colorado.

G. Pumping Adjustment for Decline in Well Efficiencies.

There is no dispute over the fact that the efficiencies of both wells and pumping plants generally decline with age unless properly maintained. RT Vol. 23 at 105. Under those circumstances, a given amount of energy may in fact pump less water than when a well is more efficient, or put conversely, it may take more energy to produce the same amount of water. If pumping is to be estimated on the basis of energy supplied and the use of a power coefficient, it may be necessary therefore to adjust that coefficient over time. Colorado made such an adjustment to its pumping estimates. Kansas did not, believing that the facts did not warrant such a change. Colorado's pump efficiency adjustment reduced its estimate of total pumping by an average of 6618 acre feet annually for the period 1950-85. Colo. Exh. 822 at 4.

Colorado relied initially, as did Kansas, on the power coefficients measured by the USGS in its 1964-68 study. Colorado, however, then adjusted those power coefficients on the basis of certain random measurements made in 1981. The 1981 investigation was part of a national program to measure power coefficients, and involved 72 wells along the Arkansas River in Colorado. Kan. Exh. 625; RT Vol. 71 at 131. Colorado expert Slattery acknowledged that this was a relatively small sample of recent power coefficients. RT Vol. 71 at 114. Also, it was not possible to equate the 1981 measurements with values

used for specific wells in the 1964-68 study. RT Vol. 69 at 126. Nonetheless, Slattery testified that the decline in pump efficiencies shown by these 1981 measurements corresponded to the opinions of Longenbaugh and Miles. RT Vol. 69 at 125, 127; RT Vol. 72 at 14, 25-26. Accordingly, Slattery developed a declining relationship between the 1964-68 and 1981 measurements, which essentially was on a straight line basis. RT Vol. 69 at 132; RT Vol. 72 at 6.

Kansas received the 1981 data during the discovery period of this case, but Book concluded that such data "did not indicate a sufficient decline in efficiency of the pumping units for 1965 to 1981" to warrant any change. Moreover, he believed that the results were heavily influenced by an "outlier" in the data, and that the Colorado analysis did not appropriately consider pump replacements. RT Vol. 125 at 42. Book assumed that pump replacement "would happen logically through the aging of the pumps and wells in the valley." *Id.*

Book's assumption, however, was vigorously disputed by Longenbaugh. On the basis of his extensive personal experience along the Arkansas River, Longenbaugh testified that efficiencies had decreased considerably over time "because of the wear of the pump and that they [farmers] don't change out the pumps." RT Vol. 63 at 190; RT Vol. 69 at 125; RT Vol. 71 at 116. There was little economic incentive to do so. RT Vol. 63 at 185. Speaking of his efforts in working with farmers to make their irrigation systems more efficient, Longenbaugh testified:

> "It cost more to get the well driller and the pump installer to go and pull the pump and put it back in than what they could save in power bills over a several year period. There was no

> incentive for them to go ahead and do it. I was amazed when I did the numbers and that is what it came out to be." RT Vol. 63 at 185.

Into the 1970s, power was sold at a declining block rate so that the more power a farmer used, the less it cost. RT Vol. 63 at 191. Most farmers did not use their wells every day, and so if additional water was needed, the farmer merely pumped another day. RT Vol. 65 at 70. Miles was also of the opinion that the efficiency of wells in existence during the 1960s had declined. RT Vol. 66 at 31. Additionally, he pointed out that some changes in irrigation systems had adversely impacted pump efficiencies. Farmers used to pump into open ditches, but many systems changed over to underground pipelines, creating an additional head on the pump and requiring more power for the same volume of water. RT Vol. 66 at 27; RT Vol. 63 at 190.

Longenbaugh testified that pump efficiencies during the 1960s were about 45-50%. In the 1980s, in his opinion, those efficiencies had declined to approximately 40-45%. RT Vol. 71 at 127. Miles testified that in his opinion even the latter efficiencies were too high under current conditions. RT Vol. 66 at 25-27. The calculations which Slattery used to adjust the 1964-68 pump efficiencies generally fell within Longenbaugh's range. RT Vol. 72 at 5. Slattery testified that he had relied "very heavily" on Longenbaugh. RT Vol. 71 at 119; RT Vol. 69 at 125.

Slattery acknowledged that he had no actual data on pump replacements, and had used the age of wells as a surrogate for the average age of pumps. RT Vol. 71 at 121. But neither did Kansas have any data on pump replacements. Very few new wells, and few replacement wells,

were drilled upstream of John Martin reservoir after 1965. Colo. Exh. 165*, Table A.1; RT Vol. 71 at 115-16. While wells continued to be drilled downstream of John Martin after 1965, the ratio of older to newer wells was still 490 wells in 1965 compared to 90 wells added thereafter through 1985. Colo. Exh. 165*, Table A.1. Longenbaugh thought that ages of the wells gave an indication of average pump age. RT Vol. 71 at 115.

On cross-examination, Kansas raised legitimate questions about the impact of one data point (Bland well) used in the 1981 study, and whether the 1981 measurements, although random, were truly representative. RT Vol. 72 at 9-19; RT Vol. 72 at 106-07. Kansas also uncovered a mistake in one of the power coefficients used by Slattery which had resulted in an underestimation of center pivot pumping from 1971 to 1985 of 300-400 acre-feet annually. RT Vol. 72 at 67, 123-24. Overall, however, Kansas offered no evidence of its own on pump efficiencies after the 1964-68 USGS measurements. Book made no independent investigation to determine how frequently pumps were repaired or replaced. RT Vol. 23 at 106.

The Kansas experts certainly understood that well efficiencies can decline with age, and that the power coefficients on which they relied were some twenty years old. Kansas failed to show that its pumping estimates did not require an adjustment because of declining pump efficiencies. While certainly the data relied upon by Colorado to reach specific acre-feet values were not as complete as might be desired, I find that the 1964-68 power coefficients on average did decline, and that an appropriate adjustment is required. The Colorado evidence is accepted.

H. Conclusions.

I conclude that the best estimate for total postcompact pumping for the 1950-85 period is 5,810,000 acre-feet, less the adjustments submitted by Colorado for declining pump efficiencies (corrected for the center pivot coefficient mistake), and less the adjustments utilizing Colorado's calculations for nonelectric pumping.

SECTION XVII

WELL DEVELOPMENT IN KANSAS

Colorado points to the fact that the large increase in postcompact wells did not occur only in Colorado, and that in western Kansas a comparable if not greater proliferation of new wells also occurred. Colorado argues that new wells increased the irrigated acreage in western Kansas to more than 300,000 acres; that such pumping has caused groundwater levels to decline substantially; that groundwater contributions to the Arkansas River in Kansas have been reduced or eliminated; that increased pumping has caused greater transit losses in the river, depleting the flows available to Kansas ditches; and that until 1978, Kansas took no action to restrict well development in western Kansas. All these facts are basically true, but they do not constitute a defense to Colorado's liability under the compact.

Article IV-D of the Arkansas River Compact protects the "waters of the Arkansas River" against material depletion from future development, which indeed includes development in Kansas as well as Colorado. However, the waters of the river are defined as those originating "upstream from the Stateline." Article III-B. The excessive pumping by Kansas farmers is essentially mining the Ogallala Aquifer. Jt. Exh. 140 at 1. While this may portend serious problems for Kansas in the future, the Ogallala groundwater supply in Kansas is not directly covered by the compact.

A. Irrigated Acreage in Kansas.

At the time the compact was approved, the acreage in Kansas irrigated by surface diversions and wells between the Stateline and Garden City was in the order of 66,000 acres.[71] RT Vol. 36 at 53; Kan. Exh. 348 at 34; RT Vol. 37 at 136-37. The evidence does not permit a breakdown between acreage supplied by alluvial wells and acreage irrigated by nonalluvial wells, if any. A recent study shows that land irrigated from the Arkansas River, that is, by surface diversions and alluvial wells, is about 57,000 acres. Kan. Exh. 358*.

Colorado refers to the acreage irrigated in 1979 in Hamilton, Kearny and Finney Counties, a total of some 351,000 acres. Jt. Exh. 139 at 15; Jt. Exh. 140 at 11; Colo. Closing Well Br. at 25. However, much of this land is outside of the service areas of the Kansas canal companies that divert from the Arkansas River. Most of the new acreage is irrigated by wells drawing from the Ogallala Aquifer, not from the Arkansas River or its alluvium. About 100,000 acres of the new irrigation referred to by Colorado were developed from the mid-1960s through the 1970s in sand hills south of the river. RT Vol. 37 at 24. This area is outside the service area of South Side Ditch, and is irrigated solely by wells using center pivot sprinklers. *Id.* at 24-27. It was the development of the center pivot system that made irrigation in this area possible.

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[71] Kramer's Report to Congress in 1949 uses the figure of approximately 65,000 acres. Jt. Exh. 16 at 37.

In Hamilton County, upstream of the Bear Creek Fault zone, there is no association between the Arkansas River and the Ogallala formation. In that reach, the river alluvium is contained in a trough eroded through bedrock. RT Vol. 29 at 134. Downstream of the fault zone, essentially in Kearny and Finney Counties, the river alluvium is separated from the Ogallala Aquifer by a "major confining zone" which consists of silt, sandy silt and clay. RT Vol. 30 at 47-49. This confining zone, which ranges from near zero to about 200 feet thick, is not an aquifer and does not provide water to wells.[72] *Id.* at 49; Jt. Exh. 140 at 8. While there is some opportunity for the vertical movement of water through the confining zone, the upper alluvial aquifer and the lower Ogallala Aquifer "act independently." RT Vol. 30 at 49, 78. It is common knowledge, of course, that the Ogallala underlies a vast area encompassing parts of several states. There was no evidence that such groundwater came from the waters of the Arkansas River originating in Colorado.

B. Increase in Kansas Wells.

The increase in the number of wells in western Kansas is shown decade by decade in a series of maps introduced by Colorado. Colo. Exhs. 284* through 289*. In 1949 there were about 416 wells in the three-county area from the Stateline to Garden City. Colo. Exh. 257*. This

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[72] The hydraulic conductivity of this zone is "very low," ranging from 1/100 to 1/10,000 of a foot per day. This compares with hydraulic conductivity in the upper alluvial aquifer of 82 to 200 feet per day, and 80 to 150 feet per day in the lower Ogallala Aquifer. RT Vol. 30 at 47-49.

number had increased to 1999 in 1985. *Id*; RT Vol. 86 at 109-111. These totals, however, include wells located outside of the ditch service areas, and wells not pumping from the alluvium of the river. RT Vol. 86 at 108-09; Jt. Exhs. 139, 140.

Since the 1960s, alluvial wells generally have not been drilled. RT Vol. 28 at 68. Both new and replacement wells, inside and outside of the ditch service areas, have been drilled into the Ogallala formation. *Id.* at 68, 85. The river alluvium is now largely dewatered, and the deeper Ogallala wells are not even perforated in the alluvium. *Id.* at 64. Water levels in the Ogallala have been declining since the 1950s, from 20 to 90 feet depending upon the location. *Id.* at 73; Jt. Exh. 140 at 1. In 1950, an average Ogallala well pumped between 1,500 and 2,000 gallons per minute. Today, the typical yield of an Ogallala well ranges from 650 to 1,000 gpm. RT Vol. 28 at 81. For the period 1968-85, pumping within the canal company service areas has averaged about 79,400 acre-feet annually, reaching a high of 149,800 in 1981. Kan. Exh. 327 at 9, Table 10A. Surface diversions during this period averaged 58,400 acre-feet annually. *Id.*

C. Impacts of Pumping in Kansas.

In 1977 the Kansas Division of Water Resources entered into a five-year cooperative investigation with the USGS. The purpose was to better define the relationships among groundwater, surface flow and climatic factors along the Arkansas River, and to evaluate the impacts of pumping on streamflow. Jt. Exh. 139 at 3. The study was divided into two phases, Phase I being

upstream of the Bear Creek Fault zone, and Phase II downstream. The results were published in 1983 for Phase I and 1985 for Phase II. Jt. Exhs. 139 and 140, respectively.

As part of its Phase I investigation upstream of the Bear Creek Fault zone, the USGS found that average streamflow at Syracuse (about 15 miles below the Colorado-Kansas border) had declined from 173,000 acre-feet during 1951-69 to 65,000 acre-feet during 1970-79. Jt. Exh. 139 at 1. During the 1970s, pumping in this reach of the river increased from 20,000 acre-feet in 1970, with fewer than 100 wells, to nearly 65,000 acre-feet in 1979, with some 160 wells. *Id.* at 53. Static water levels in the alluvial aquifer declined during the 1970s by about 4 feet. *Id.*

In the early postcompact years, i.e., 1951-69, this portion of the river was in hydrologic equilibrium. About as much water came into the stream-aquifer system as was discharged from it. *Id.* at 55. Since the "prolonged streamflow reductions" beginning about 1970, the USGS found that discharge exceeded recharge. *Id.* The USGS concluded that water levels and streamflow within the study area were "more directly affected by the reductions in incoming streamflow . . . than by either the smaller than average amounts of annual precipitation or the increased pumpage during the 1970s." *Id.*

In the area downstream of the Bear Creek Fault zone, under predevelopment conditions the groundwater levels and hydraulic head (pressure) in the Ogallala Aquifer resulted in upward leakage into the alluvial aquifer and the Arkansas River. RT Vol. 30 at 67; Jt. Exh. 140 at 22. But

this condition changed with increased pumping, and during the 1970s water leaked from the upper down into the lower aquifer. RT Vol. 30 at 68; Jt. Exh. 140 at 8, 22. Phase II of the USGS study embraces this area from the fault zone to a point slightly downstream of Garden City, a distance of about 45 miles. Jt. Exh. 140 at 2, 7.

The lower or Ogallala Aquifer is the source for virtually all of the groundwater pumped in this Phase II area. *Id.* at 8. One study cited by the USGS estimated that in 1980 approximately 2,900 wells pumped about 738,000 acre-feet of water. *Id.* at 11. The aquifer is being heavily mined. In 1980 the USGS model indicated that 307,600 acre-feet were withdrawn from storage. *Id.* at 51. The upper or alluvial aquifer has been dewatered since the mid-1970s. *Id.* at 48. However, considering the reach of the Arkansas River from the Bear Creek Fault zone to Garden City as a whole, the river has been a losing stream since 1923. *Id.* at 15. Most of the loss (recharge to the alluvial aquifer) from 1923-70 occurred in Finney County, but during the 1970s the river also lost flow throughout most of Kearny County. *Id.* This was the result of decreased river flow from upstream, and from pumping which lowered groundwater levels and reduced or eliminated groundwater contributions to the river. *Id.*

Kansas did not aggressively address these conditions until January of 1977 when the chief engineer of the Kansas Division of Water Resources declared a moratorium on the approval of new well applications in a 500 square mile area along the river in Hamilton and Kearny Counties. RT Vol. 37 at 53. (The moratorium did not include Finney County. Jt. Exh. 140 at 2.) Well permits have been required only since 1978. RT Vol. 28 at 6; RT

Vol. 37 at 27, 32. In 1986, as a follow-up to the moratorium, Kansas established an intensive groundwater use control area (IGUCA) which generally conforms to the alluvium from the Stateline to Garden City. Jt. Exh. 82 at 26-27. This area was designated under a 1982 Kansas statute authorizing the chief engineer to act when groundwater levels have declined "excessively," or pumping exceeds the rate of recharge. *Id.* at 3. Under this authority, David L. Pope, the Kansas chief engineer and a principal witness during the trial, closed the IGUCA to any new appropriation of groundwater or surface water, except for domestic uses. *Id.* at 29. There has been no action, however, to restrict the quantities of water pumped from wells with existing permits. RT Vol. 37 at 56.

Colorado could be affected by the pumping in Kansas in two ways. First, under the compact and absent the 1980 Operating Plan, neither state is allocated a specific share of the water stored in the conservation pool in John Martin Reservoir. Instead, the stored water is a common resource to be released ". . . upon demands by Colorado and Kansas concurrently or separately at any time during the summer storage period." Article V-C. Helton and others testified that the development of postcompact wells in Kansas reduced the usable flow of the river in Kansas by increasing seepage or what was termed "transit losses." Indeed, this appears to be true, although the extent may be in issue. In any event, the result could mean additional demands by Kansas on the stored waters in John Martin Reservoir, thereby reducing the amount available to Colorado.

However, Helton testified that these potential consequences have not in fact occurred. He said that during the 1970s, any increased percolation of river water in Kansas would not have affected its use of conservation storage. At that time, he thought, Kansas would have called for the release of all such water without regard to transit losses. RT Vol. 115 at 33-34. Helton testified that before the 1970s river flows were not substantially impacted by the Kansas wells. *Id.* at 33. And, of course, after the 1980 Operating Plan was in effect Kansas had its own storage account in John Martin Reservoir and its use of that water did not affect Colorado's storage account. In short, the evidence shows that increased pumping in Kansas has not adversely impacted Colorado's supply.

Secondly, pumping in Kansas could affect the determination of usable flows at the Stateline. Under Spronk's analysis, flows contributing to increased groundwater recharge were treated the same as diversions. This was not true in the Durbin-Larson analyses. Each of these latter experts calculated flows for groundwater recharge on the basis of precompact conditions. However, I am recommending against using the Spronk methodology for this and other reasons, and increased pumping in Kansas will not affect the determination of usable flow at the Stateline if my recommendation is approved.

SECTION XVIII

KANSAS' ORIGINAL HYDROLOGIC-INSTITUTIONAL MODEL

During the preparation of this case, and during the first part of the trial, the chief technical witness for Kansas was Timothy J. Durbin. Mr. Durbin holds a Master of Science degree (1971) in civil engineering from Stanford, and is a former District Chief, California District, for the USGS. He joined the USGS in 1972 and has substantial experience in hydrologic modeling, primarily in California and Nevada.[73] He had no prior experience with the Arkansas River. He left the USGS for private practice in 1984, and soon joined the national firm of S. S. Papadopulos & Associates in charge of their Davis, California office. He began working for Kansas on this case, as part of the Papadopulos firm, in 1985. RT Vol. 39 at 65. In 1989 the Davis office of the firm was split off, and Kansas chose to remain with Durbin as its primary expert.

Durbin began his investigation on behalf of Kansas by examining seven possible causes of the depletions of Stateline flows: declines in High Plains runoff; declines in High Plains precipitation; changes in basin inflows; post-compact pumping in Colorado; the Winter Water Storage Program; the 1980 Operating Plan for John Martin Reservoir; and increased phreatophyte consumption. RT Vol. 39 at 66-67.

Durbin concluded that High Plains runoff was only a small portion of the overall water supply of the river and

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[73] A complete statement of his qualifications and experience is found in Kan. Exh. 485.

that changes in such runoff, either because of precipitation or land use practices, were not an explanation for Stateline depletions. RT Vol. 39 at 70. Those factors were dropped from consideration and Durbin concentrated his investigation on the five remaining potential causes of the declines in Stateline flows. Three separate approaches were used: a statistical analysis, a water budget analysis, and the hydrologic-institutional ("H-I") model. RT Vol. 39 at 72.

From the statistical and water budget analyses, which are both fairly traditional approaches, Durbin concluded that for a given basin inflow the Stateline flows were substantially lower in the late postcompact period (1970-85) than in the earlier postcompact period (1948-59), and that increased consumption within Colorado had caused the decline. Kan. Exh. 60*; RT Vol. 40 at 43-44; Kan. Exh. 99G; RT Vol. 41 at 120-21. So long as supply remains constant,[74] Durbin testified, streamflow depletions at the Stateline mean that somehow consumption has increased within Colorado. RT Vol. 39 at 73; RT Vol. 41 at 23-24. Durbin acknowledged, however, as did later Kansas experts, that the statistical plots did not provide an explanation for the decline, and that the water budget analysis did not quantify the effects of possible individual causes, e.g., pumping, the WWSP, or increased consumption by phreatophytes. Durbin testified that the

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[74] There has been no showing of a significant decline in inflow to the mainstem of the Arkansas River. Gaged tributary inflow shows a small decrease; the evidence on ungaged tributary inflow is in sharp conflict.

H-I model was developed in order to distribute the overall effects to individual causes. RT Vol. 39 at 73. Kansas' replacement expert Larson also confirmed that the only way to quantify the effects of an individual cause of depletions was through the modeling analysis. RT Vol. 127 at 135.

A. The Basic Structure of the H-I Model.

The H-I model is a computer model which receives input in the form of certain hydrologic data and institutional conditions, as well as the output of other analyses. The H-I model attempts to integrate both surface water and groundwater processes in the Arkansas River Basin from Pueblo to the Stateline. It represents an enormously difficult task, the complexities of which may not have been fully appreciated when Durbin began to develop the basic structure of the model.[75]

Mr. Durbin relied, somewhat optimistically I believe, upon an earlier model developed by the USGS for the same reach of the Arkansas River. Jt. Exh. 78. This model, too, integrated both groundwater and surface water operations, and according to Durbin was a hydrologic-institutional model. The report on the earlier USGS model was issued in 1974, and it covered the period from 1941 to 1965. However, the USGS model was designed only to make a broad assessment of twenty-four different water

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[75] In 1989, Dr. Lawrence J. Lefkoff, who received his doctorate degree from Stanford in 1988, began to assist Mr. Durbin, and ultimately became primarily responsible for certain portions of the H-I model analyses.

management plans. It was neither required nor intended to provide the level of accuracy and detail demanded in an adversarial trial. The simplifications used reflected the limited purpose of the model. For example, the model did not represent any winter diversions by Colorado ditches; it did not represent off-channel storage reservoirs; it did not represent conservation storage events in John Martin reservoir during the summer; and well pumping was not actually determined, but rather was based upon allowing wells to pump to their maximum capacity in order to satisfy the unmet demand of all the land under the respective ditches. This overestimated actual pumping. RT Vol. 86 at 139-42.

Typically, hydrologic models are used to predict future flows or conditions in light of certain assumed changes, such as the proposed construction of a reservoir. If the model has been properly verified to match historical conditions, reasonably reliable results can be expected. The computer modeling process is widely used and accepted. Indeed, it seems that no major water problem can now be solved without a model, even though models generally rely upon the future repetition of a past hydrologic cycle that is not likely to be the same. But in this case, the model must be used to unravel a more difficult problem than is usually addressed. The task is to determine what usable Stateline flows would have occurred if in fact certain actual historical events had been different, namely, if postcompact pumping had not increased, or if the Winter Water Storage Program had not been instituted. Not only are there critical data problems in the more distant years, but the process even

requires assumptions about what people would have done if their actual behavior had not been allowed.[76]

Dr. Freeze testified that groundwater models are generally accurate only between 10 and 20 percent. RT Vol. 70 at 137, 154. When groundwater models are integrated into an overall model involving surface flows, he testified that "large errors" could be expected and that they could exceed 20 percent. RT Vol. 70 at 150-54. Modeling a system like the Arkansas River would be "difficult," he said, though he acknowledged it would not be impossible. RT Vol. 70 at 153; RT Vol. 105 at 42. Asked about the sharp differences in modeling results in this case, Dr. Freeze said that the experts on both sides "are extremely well regarded," and are among the "best experts that there are in the country." RT Vol. 105 at 45. However, besides the inherent difficulties in trying to reproduce conditions over 36 years along 150 miles of river, and a certain lack

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[76] Dr. Robert Allan Freeze, one of the pioneers in the application of digital computer models to groundwater problems, put it this way:

> "The point you are making is that in classical modeling we are usually trying to go into the future. The what-if games we play in the classical model usually involve calibrating against what happened up to this point in time. Then predicting the future, what would happen if somebody did something different in the future. I understand the what-if games you are playing here. What-if things that happened in the past hadn't happened. So it is a different kind of game, yes." RT Vol. 105 at 41.

Dr. Freeze is a professor in geological engineering at the University of British Columbia who served on the Technical Advisory Committee organized by Colorado. His exceptional qualifications are found in Colo. Exh. 670.

of reliable data, he thought that the litigation process was partly responsible for the wide disagreements among the experts. It is a "new world" for such experts, he said, and a process that "drives us apart." RT Vol. 105 at 46.

The H-I model is actually an integrated family of models, modules and sub-routines. RT Vol. 42 at 29-30; RT Vol. 87 at 34. Included are two groundwater models for the valley fill aquifer and eight for the bench areas. For two particularly long canals (Fort Lyon and Amity), groundwater models were also developed to calculate individual response functions for canal seepage. Runoff from ungaged tributary basins was estimated by a rainfall-runoff model, and annual values from that model were distributed into monthly values through a special version of the H-I model, sometimes referred to as the "GLOBAL" version. The model predicted surface diversions, dividing the river into 18 reaches, and using 89 separate water rights for 23 canal companies. Another subroutine calculated the amount of water consumed by crop evapotranspiration, and the amount of applied water returned to the river as surface runoff or recharged to the groundwater system.

The study period for the H-I model runs from January 1950 through December 1985, a total of 432 months. Output from the model is provided at monthly time intervals. The model accounts for all major diversions from the Arkansas River between Pueblo and the Stateline, and for irrigation pumping from both the valley fill and bench aquifers. The model represents the off-channel reservoirs, as well as the operations of John Martin and Pueblo Reservoirs. Transmountain water which enters the

system at Pueblo is accounted for. Consumption by phreatophytes and river and reservoir evaporative losses are considered, as well as canal and lateral seepage losses. Irrigation return flows to the river, both on the surface and through the groundwater system, are represented for each canal service area. Tributary inflows from the major tributaries are included, along with precipitation within the study area. Water consumption processes, such as crop evapotranspiration and noncrop evapotranspiration are also included.

B. Original Results of the H-I Model.

The H-I model evaluated four separate institutional conditions: postcompact pumping; the Winter Water Storage Program; transmountain water imports; and the 1980 Operating Plan for John Martin Reservoir. The inclusion or exclusion of these four institutional conditions as they were used in various model runs were often described as being controlled by "switches." In the various exhibits, the "on" position for each of these institutional conditions is signified by an "H" (historical conditions). The "off" position is signified by a "C" (compact conditions). When transmountain deliveries are excluded, the exhibits show "0" (no deliveries).

Model results are calculated as the difference between a pair of runs. For example, to show the Stateline depletions caused by postcompact pumping, the first run of the model is made on the basis of actual historic conditions, that is, all switches are "on." The second run would have a single change, that is, postcompact pumping would be reduced to the 1948 compact level. The

difference in Stateline flows would represent the depletions caused by the additional postcompact pumping. This example is shown as Comparison "F" on Kan. Exh. 111* (12/6/90). Total depletions from postcompact pumping as shown by this model run, without taking accretions into account, amount to 1,581,000 acre feet for the 1950-85 period. These are depletions of total flow, not usable flow.

Durbin relied upon Comparison "C" of Kan. Exh. 111* (12/6/90) to show the combined effects of postcompact pumping in Colorado and the Winter Water Storage Program. RT Vol. 45 at 81. Under this scenario, total depletions without considering accretions amounted to 1,427,000 acre-feet. After deducting accretions, the net depletions were 1,029,000 acre-feet. In Durbin's view, the issue of whether or not accretions should be taken into account was in part a legal consideration and in part a hydrologic consideration. The hydrologic aspect was that although accretions in a given month could be isolated, they would not necessarily make up for depletions in another month. RT Vol. 44 at 120. The depletions shown on Kan. Exh. 111* (12/6/90) were to total, not to usable, flow.

The original Kansas claim, as confirmed during Durbin's testimony and based on the H-I model, was 917,000 acre-feet. RT Vol. 45 at 124-25. This represented depletions to usable flow over the 1950-85 period resulting from the combined effects of postcompact pumping and the WWSP. Kan. Exh. 112* (12/6/90) Comparison "C"; RT Vol. 45 at 125. This analysis considered that the 1980 Operating Plan for John Martin Reservoir was in effect during both of the comparison runs. In contrast, and

based on the revised version of the H-I model, the present Kansas claim for depletions to usable flow caused by pumping and the WWSP together, comes to 489,000 acre-feet.[77] Kan. Exh. 111***.

C. Colorado's Criticism of the Original Version of the H-I Model.

Kansas complains that Colorado in its opening post-trial brief spent some 150 pages attacking Durbin and the original version of the H-I model. Kansas calls it "largely a waste of the Special Master's time" because substantial revisions were made to the H-I model, and to Durbin's analysis, by the Kansas replacement experts. Perhaps more aptly, Kansas also noted that Colorado's emphasis tended to obscure the fact that its own water budget analysis showed total depletions of approximately 583,000 acre-feet resulting from postcompact pumping.[78]

The major changes in Kansas' position and evidence cannot be ignored. For some five years the Kansas experts worked to accumulate the necessary data and to develop the H-I model in order to support the state's claims. Yet after Colorado's cross-examination during trial uncovered numerous errors and shortcomings in the Kansas

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[77] The comparison with 917,000 acre-feet is not exact because the depletion figure of 489,000 acre-feet assumes that the 1980 Operating Plan was not in effect, either during the historical run or the combined effects run. The comparable figure from the revised H-I model is 496,000 acre-feet (1980 Plan included in both runs). Kan. Exh. 651, comparison 4.

[78] Colo. Exh. 135* at 6.1; RT Vol. 115 at 73-75. These are depletions of total flow, however, not depletions of usable flow.

evidence[79], and after the trial recess caused by Durbin's hospitalization, Kansas' replacement experts testified to substantially different conclusions than those resulting from the original H-I model. Brent E. Spronk, one of Kansas' replacement experts, testified openly that the results of the original H-I model were not reliable.[80] As part of its replacement case, Kansas made numerous changes to the original H-I model, but did not alter its basic logic and structure. RT Vol. 88 at 52. In addition, Kansas submitted 63 revised exhibits and 10 new exhibits. As a result of these changes, Kansas cut its claimed depletions approximately in half. Under Durbin, the Kansas claim was 917,000 acre-feet for both pumping and the WWSP. It is now 489,000 acre-feet. Kan. Opening Br. at 128.

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[79] The errors were not confined to the H-I model. Of some 25 exhibits prepared to support Durbin's statistical analysis, all contained errors. Durbin prepared revised exhibits for 24 of these, but there were also errors in the revised exhibits. RT Vol. 48 at 4-17. Dr. Lefkoff apparently supervised the preparation of these exhibits. RT Vol. 47 at 83, 87.

[80] Spronk said: "I don't believe that those results [of the H-I model] are reliable or accurate in terms of the magnitude of impact that they showed at the state line . . . ." RT Vol. 88 at 93-94; RT Vol. 89 at 103-04. Spronk was one of the experts involved early in the preparation of the Kansas case, but his role then was confined largely to developing raw data, and to work on the operation of Trinidad Reservoir (decided on motion, in Part III of this Report). Spronk holds a 1978 master's degree in civil engineering from Colorado State University, and is president of Spronk Water Engineers. His resumé is Kansas Exhibit 481, and his experience includes an earlier report on the Arkansas River done when he was employed by Simons, Li & Associates. Jt. Exh. 88.

Colorado assigned one of its experts, Dewayne R. Schroeder, solely to the task of reviewing and understanding the H-I model.[81] Schroeder was ultimately able to extract the specific data used in the model as well as the values used for such parameters as canal seepage, tailwater runoff and noncrop consumptive use, each of which was improper in his view. As a result of his analysis, Schroeder also identified 16 separate coding errors and inappropriate assumptions in the original H-I model. RT Vol. 87 at 53-67. There is no need to address them in detail here, except perhaps to note that the coding error with respect to monthly inflow at Pueblo dramatically changed the impacts of the WWSP calculated by the model. RT Vol. 87 at 54, 67. The validity of these criticisms was essentially confirmed by Kansas' replacement experts, who responded to each of them.

However, Schroeder and other Colorado experts testified to additional deficiencies in data and model structure that were not changed in the revised version of the model. These included reliance upon the rainfall-runoff model to estimate ungaged tributary inflow; failure to calibrate the groundwater model to water levels; treatment of the groundwater aquifer as a linear system; unreasonable estimates of deep percolation; failure to divide the river into sufficient reaches; failure to account for precipitation in the logic used to predict Kansas'

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[81] Schroeder is an engineer employed by the Colorado Division of Water Resources. Since 1984 he has been head of the Chief Engineer's Special Studies Unit, concerned primarily with groundwater modeling.

demands for releases from John Martin Reservoir; inaccurate assignment and distribution of pumping and irrigated acreage figures among the various canal companies; and underestimation of water consumption by phreatophytes.

Dr. Devraj Sharma,[82] Colorado's expert in groundwater modeling, was particularly critical of Durbin's efforts to calibrate Kansas' groundwater models. Durbin presented a series of hydrographs to show the match between predicted and observed groundwater levels. Kan. Exhs. 89C, 89D. But Dr. Sharma pointed out that of the 106 hydrographs shown, 30 had been "clipped" so as to appear more favorable than they really were. RT Vol. 81 at 7-23; Colo. Exh. 809. When Sharma plotted actual predicted water levels, instead of merely changes in levels, it appeared that 30% of the wells showed water levels that were either above the surface of the ground, or were below bedrock. Dr. Freeze did not consider such a model to be properly calibrated. RT Vol. 105 at 53-54.

While Kansas' replacement experts made a number of changes to Durbin's groundwater models, they did not recalculate the hydrographs used by Durbin. RT Vol. 100 at 45-47. Larson testified that it would have been a "relatively difficult step to go through," and the hydrographs

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[82] Dr. Sharma's broad experience and qualifications are summarized in Colorado Exhibit 668*. His Ph.D is from London University, and he has been a visiting professor at a number of universities around the world. He has extensive expertise in mathematical modeling, and developed the groundwater models used by Colorado in its water budget analysis. He was with Dames & Moore from 1975 to 1983 and moved to Denver in 1978. Currently, he is president of Principia Mathematica Inc.

were only one of several bases for judging the adequacy of the groundwater component of the revised H-I model. *Id.* Instead, Larson calibrated against winter streamflows, a procedure that Colorado experts thought should have been coupled with comparisons to measured groundwater levels. RT Vol. 105 at 52-53, 59; RT Vol. 106 at 26. Schroeder testified that the H-I model always tended to overpredict diversions, and that its problems "go quite deep." RT Vol. 111 at 62.

The Colorado view that inherent flaws still remain in the H-I model, even after the revisions that have been made, was also shared to some extent by experts for the United States. Their testimony is discussed in Section XXII on the WWSP.

SECTION XIX

KANSAS' REPLACEMENT CASE

Following the continuance occasioned by Mr. Durbin's illness, Kansas resumed its case in chief. A "replacement case" was presented through five "replacement experts." Three members of the replacement team had testified earlier (Spronk, Book, Lefkoff), but they now played expanded rolls. The two other replacement experts were Steven P. Larson and Thomas A. Prickett. In addition to making numerous corrections and revisions to the H-I model, Kansas lodged 63 revised exhibits and ten new exhibits. Included were revisions to Durbin's statistical and water budget analyses. Some of the lodged exhibits reflected necessary corrections, but other model changes and revised exhibits actually represented an effort to improve Kansas' case, responding to matters that had been raised on cross-examination.

Colorado moved to exclude a number of the lodged exhibits and to require that portions of the replacement case be presented only in rebuttal. Colorado argued that Kansas had taken advantage of the continuance "to redo parts of its case," and that was not the purpose of the continuance. RT Vol. 88 at 29-30. To be sure, there was some merit in Colorado's reaction, but in the last analysis I concluded that it was more important to have the best evidence available in the record. Colorado's motion was denied. Any prejudice to Colorado was sought to be remedied by giving Colorado whatever time was necessary to prepare proper cross-examination and to respond as part of its surrebuttal case.

The chief replacement witness was Steven P. Larson. He holds a 1971 Master of Science degree in civil engineering from the University of Minnesota. From 1971 to 1980 he was employed by the USGS and had extensive experience there in the research and development of models, principally groundwater models. In 1980 he joined the consulting firm of S. S. Papadopulos & Assoc. as a vice-president. That is his present employment. As a member of that firm he has had considerable experience in major litigation involving the interaction between groundwater and streamflows on the Pecos and Rio Grande Rivers. He has also done work for the Colorado state engineer.[83]

When Kansas engaged the Papadopulos firm to assist in this case, Durbin essentially acted as the project manager. RT Vol. 98 at 84-85. Larson was involved only as an advisor to Durbin and as a reviewer. After Durbin left the Papadopulos firm in 1989, Larson continued to act as an advisor, but on a relatively limited basis. *Id.* at 85.[84]

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[83] His full qualifications appear in Kan. Exh. 488.

[84] As a member of the team of replacement experts, Larson was asked to review the statistical and water budget exhibits presented by Durbin; to assist in the review and revision of the H-I model; and to draw conclusions as to whether and to what extent streamflows had been depleted by postcompact pumping in Colorado and by operation of the Winter Water Storage Program. RT Vol. 98 at 86.

A. Review of the Statistical and Water Budget Analyses.

Kansas' replacement case included revisions to its statistical and water budget analyses, as well as to the H-I model.[85] The revised exhibits presenting the results of the statistical and water budget analyses corrected numerous errors that had been identified in earlier versions of the exhibits, and contained slightly different time periods for comparison. The exhibits continued, however, to present data comparisons of precompact and postcompact conditions, and early and late postcompact years. The revised exhibits continued the use of statistical plots, the use of regression analyses, and in part the use of a parallel line model. Larson testified that these revised exhibits supported the general conclusions reached earlier by Durbin, namely:

1. Stateline flows were lower in the postcompact period than in the precompact period for any equivalent amount of annual basin inflow. RT Vol. 98 at 89.

2. Stateline flows at any particular level of basin inflows were lower in the late postcompact period than in the early postcompact period. RT Vol. 98 at 100.

3. There is a trend of decreasing Stateline flows associated with increased amounts of pumping. RT Vol. 98 at 101.

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[85] See especially Kan. Exhs. 59**, 60**, 61**, 63**, 70**, 99D**, 99F*, 99G**, 100D**.

4. There is a tendency for pumping to increase as basin inflows decrease, that is, as less surface water is available for diversion. RT Vol. 98 at 106, 109.

5. "Consumption" in Colorado increased in the late postcompact period relative to the early postcompact years.[86] RT Vol. 98 at 117, 125-26.

Larson acknowledged, however, as had Durbin, that the various statistical plots did not explain the causes for the differences shown. This was the reason that it was necessary to move into modeling. RT Vol. 98 at 90; RT Vol. 100 at 19; RT Vol. 127 at 135. Nonetheless, factors identified by Larson that might account for the statistical differences included the operation of John Martin Reservoir, pumping in Colorado, the Winter Water Storage Program, and the increased water use by phreatophytes.

In connection with the water budgets, it should be noted that ungaged tributary inflow was based upon the runoff predicted by Kansas' rainfall-runoff model, and the consumptive use by phreatophytes reflected the earlier testimony by Kansas' expert. Both of these items are disputed by Colorado. Overall, Larson relied upon the statistical and water budget analyses to provide "sort of first-order estimates," and used them mostly "to look at trends in the relationships between the variables." RT Vol. 100 at 17-19, 50-51. However, he also testified that the

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[86] "Consumption" was simply the residual in the water budgets and included many conditions in addition to consumptive use by crops. RT Vol. 98 at 115.

depletions shown by the H-I model corresponded generally with the quantities in the water budgets. RT Vol. 99 at 92-96.

B. Revisions to the H-I Model.

Significant changes were made in the H-I model. RT Vol. 100 at 47; RT Vol. 110 at 104. Some 900 lines were added to the model code. Kan. Exh. 639; Colo. Exh. 765. An eight-page list describes 53 changes to the model code. Kan. Exh. 640. Another list shows the data files that have been changed. Kan. Exh. 641. Schroeder acknowledged that the sixteen coding errors and inappropriate assumptions previously identified had generally been corrected. RT Vol. 110 at 107-117. He testified that there were no coding errors in the revised model. RT Vol. 139 at 117.

However, many other changes were also made. Principally, the replacement experts no longer used the special version of the original H-I model to estimate monthly tributary inflow, but rather inserted the annual values predicted by the rainfall-runoff model as direct input into the revised H-I model. RT Vol. 89 at 128; RT Vol. 96 at 43. In connection with the groundwater models, the replacement experts did not calibrate against changes in ground water levels as Durbin had done, but rather used winter streamflows for their calibration. RT Vol. 100 at 45-47. Larson testified that they did not go back and recalculate the clipped hydrographs because of the relative difficulty of that step, and because "it was only one of several bases for judging the adequacy of the ground water component of the [H-I] model." RT Vol. 100 at 47. He said that the

groundwater models should be viewed as part of the H-I system, not as separate units, and that evaluating the overall results of the H-I model included an evaluation of groundwater conditions and the response functions derived from the groundwater models. RT Vol. 99 at 76-77.

Initially, the replacement team was not able to calibrate the H-I model as it had been corrected and revised. RT Vol. 88 at 79; RT Vol. 95 at 139. Predicted diversions under the historic simulation of the model were much higher than the observed data. Calibration was achieved only through the insertion of two "calibration factors," namely, a diversion reduction factor and a canal capacity reduction factor. Both of these factors restricted model diversions by certain water-short ditches.

The diversion reduction factor was applied seasonally to the Amity and Colorado Canals, to the Fort Lyon junior rights, and to the Great Plains reservoir system. RT Vol. 88 at 78. This calibration factor reduced diversion amounts between 15 and 25 percent when applicable. RT Vol. 88 at 82. In addition, the canal capacity reduction factor artificially reduced, for model purposes, the capacities of a number of major canals below their known actual physical capacities. Colo. Exhs. 695 and 903. The effect of both these factors was to limit diversions by certain canals at certain times even though water was available in the river, even though the canals had both the rights and physical capacities to divert, and even though the need for water was apparent. Moreover, water thus required by the model to pass downstream was routed directly into the conservation pool at John Martin Reservoir or down to the Stateline, and was

treated as being unavailable for use by any intervening diverter. RT Vol. 111 at 55. Dr. Lefkoff testified that this constraint was necessary in order to achieve calibration. RT Vol. 95 at 139. Larson and Spronk testified to the same effect. RT Vol. 127 at 52-57; RT Vol. 128 at 38-42; RT Vol. 88 at 79.

Schroeder acknowledged that the H-I model, as revised, was calibrated. RT Vol. 138 at 98. However, he objected strenuously to the way in which calibration had been accomplished. Use of the diversion and canal capacity reduction factors, in his opinion, were inappropriate because they did not "represent any physical process."[87] RT Vol. 111 at 52. He testified that model results are not necessarily reliable simply because the model has been calibrated, that is, simply because predicted and observed values match reasonably well. RT Vol. 138 at 100. Dr. Freeze agreed that a model can appear calibrated but still be in error because of paired parameters, both of which are in error. RT Vol. 70 at 136.

Kansas experts, however, defended the use of these calibration factors as appropriate modeling techniques. RT Vol. 127 at 52 *et seq*. Larson testified that the use of calibration parameters in all forms of modeling analyses is common practice. *Id*. They are designed to improve a model's performance and often are required to compensate for lack of basic data. They need not be physically based. *Id*. at 53. Larson noted that the Colorado water budget employs such a parameter called "maximum farm

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[87] Helton testified that the application of the diversion reduction factor was the "most important deficiency" in the revised H-I model. RT Vol. 115 at 45.

efficiency." *Id.* at 54. It is not physically based, but operates at times to constrain consumptive use. *Id.* at 54-55. According to Larson, calibration is not simply a mechanical process, but must include "the judgment and experience of the analyst . . . in order to get reasonable results." RT Vol. 98 at 134.[88]

C. Calibration Results of Revised H-I Model.

In evaluating the performance of the revised H-I model, the Kansas experts focused on matching predicted and observed streamflows and diversions because that is what the model was designed to determine. Larson illustrated the model's calibration mainly through two exhibits: Kan. Exh. 566G*-566L* and Kan. Exh. 568*. The first of these exhibits includes a series of charts or line diagrams illustrating the comparison between model calculations of streamflows and actual observed flows at a number of different points along the Arkansas River. Larson testified that the revised model was able to replicate streamflow conditions reasonably well. RT Vol. 99 at

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[88] Larson also pointed to a number of USGS modeling studies along the Arkansas River that generally support the approach used by Kansas. Included are studies that combine surface and groundwater models, that treat the system as linear for modeling purposes, that use unit response functions to simulate the interaction between groundwater and surface flows, that predict diversions, and that are calibrated against streamflows. Jt. Exhs. 74, 75, 76, 77, 78; Kan. Exhs. 441, 442, 668, 687. All of these approaches or assumptions, when employed by Kansas in the H-I model, invoked criticism from Colorado experts.

81-88.[89] While the scale of these charts is quite small, the correspondence between predicted and measured flows seems reasonable. However, Helton produced tables of numerical amounts of flow that put in question the model's performance at points upstream from the Stateline. Colo. Exhs. 908, 996. These are discussed later.

Larson also testified with respect to Kansas Exhibit 568*, which is a line chart and scatter diagram illustrating the correspondence between observed and predicted diversions. He thought that the revised model did a "very good job" of simulating total diversions in the Arkansas Valley in Colorado, despite the criticisms about the use of diversion reduction factors. RT Vol. 99 at 90.

Based upon these exhibits, together with Kansas Exhibits 570* and 571*,[90] Larson testified that the revised H-I model was sufficiently calibrated to make comparative runs between historical or baseline conditions and alternative institutional conditions.[91] RT Vol. 99 at 92.

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[89] His characterizations ranged from "quite well" upstream, to "reasonably well" at midstream, and to "reasonably good" at the Stateline.

[90] These exhibits divided total diversions into upstream and downstream comparisons.

[91] Dr. Sharma, Colorado's expert in groundwater modeling, testified that a model should not only be calibrated but also "verified." This process involves holding back certain historical data from the calibration process, calibrating the model using only the remaining data, and then comparing predicted model results with the withheld historical data. Larson termed this procedure a luxury, "very rarely done in practice." RT Vol. 98 at 139. He testified that this case presents a very complicated problem where we have to use "all of the data we can get our

Larson was unwilling to agree that calibration determined whether or not a model was "accurate" or could be "reliably used." He defined calibration as "trying to obtain the best estimates of the parameters, so when we used the model, we get the best estimate of the results." RT Vol. 98 at 140; RT Vol. 128 at 68-69. It was his opinion that "we have obtained the best parameter set that we can given the information we have available to us. So as a result, the calculations of the model will represent my best estimate of conditions along the Arkansas River Valley with respect to this particular model. And then when we use it to calculate conditions for an alternative scenario, that would represent my best estimate of what that scenario would be." RT Vol. 98 at 140. Spronk also testified that the model results provide the best estimates of depletions.[92] RT Vol. 88 at 118.

Larson recognized the presence of uncertainty in the revised H-I model results. RT Vol. 99 at 29. But he testified that when two model results are subtracted one from the other in order to get the difference, the uncertainty associated with the difference will not necessarily be as great as the uncertainty in each of the individual model runs. *Id.* The reason is that many of the approximations used in the model are the same in both model runs. If there is error in these data, Larson testified that such

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hands on to do the calibration." RT Vol. 99 at 80. Dr. Freeze had not examined either the Kansas or Colorado models, but he said that verification is "good practice." RT Vol. 70 at 139.

[92] Dr. Freeze agreed there is no "right answer" from a calibrated model, only a best estimate of the right answer given the data you have and the methods used. There is "a range of answers," he said. RT Vol. 70 at 146.

correlated errors "will tend to cancel out." RT Vol. 99 at 30. He termed this "canceling effect" an important factor in considering how the revised H-I model is used in this case.[93] *Id.* The situation would have been different, he pointed out, if Kansas had tried to compare the alternative institutional condition not with another model run, but rather with actual measured historical data. *Id.* The United States expert, Charles W. Binder, agreed that the parallel run theory and the consequent cancellation of error is a "common method that is used in modeling." RT Vol. 118 at 100. However, for reasons discussed in Section XXII, he did not believe it applied in the analysis of the Winter Water Storage Program. *Id.* at 101.

Both Colorado and the United States introduced evidence comparing actual observed Stateline flows with those predicted by the revised H-I model when operated in its historic mode (HHHH, i.e., all institutional switches "on"). Colorado Exhibit 908 shows that for the 1950-85 period actual observed Stateline flows totaled 5,186,496 acre-feet. For the same period of time, the H-I model predicted a total of 4,646,992 acre-feet. Thus, the revised

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[93] Dr. Young Yoon, one of Colorado's expert witnesses, developed a model to isolate the possible impacts of stock ponds and soil conservation measures within the Purgatoire River watershed. His results were derived from a comparison of two model runs, not from a comparison with actual measured flows. RT Vol. 101 at 19-20. In this way, he testified, whatever error might exist in the models would be the same, and any such errors would "cancel out" when you take the difference between the two runs. *Id.* at 22, 25. He added, however, that whether errors cancel depends upon how a model is applied. *Id.* at 76.

H-I model underpredicted total Stateline flows by a little more than ten percent.

The United States prepared similar exhibits, but excluded the extraordinary high flood flows in certain "outlier" months. The months excluded were May and June of 1951 and June, July, August and September of 1965. Excluding these outliers, the United States exhibits show a close correspondence between observed and predicted H-I model flows. For the compact years of 1951-85 actual Stateline flows averaged 119,954.9 acre-feet annually. U.S. Exh. 24*. For the same period of time, the H-I model predicted an annual average of 121,973.3 acre-feet annually. U.S. Exh. 25*. Thus, over the full 1951-85 period, the difference between actual and predicted annual average flows amounted to only 2018.5 acre-feet. U.S. Exh. 26*. The United States exhibits also show that the years in which the model underpredicted are about equal in number to those in which it overpredicted. Moreover, the largest annual underprediction is on the same order of magnitude as the largest overprediction. U.S. Exh. 26*.

Colorado argues, however, that it is not enough for the H-I model to match Stateline flows; that it should also perform well throughout the length of the river. Helton testified to what he called "imbalances" upstream. RT Vol. 133 at 95. Colorado Exhibit 996, which excludes the outlier months of May 1951 and June 1965, shows that the revised H-I model underpredicts streamflows at La Junta by 17 percent; then closely matches observed flows at Las Animas, which is just upstream from John Martin Reservoir; then overpredicts the outflow from John Martin by 7 percent; and farther downstream at Lamar overpredicts

by 50 percent. Finally, the model comes back into almost perfect correlation at the Stateline. Helton testified that these imbalances indicate errors in the model, either in the input data, in the assumptions, or in the calibration parameters.[94] RT Vol. 133 at 93-95.

Expert witnesses for the United States generally supported the Colorado criticisms of the H-I model. Their testimony is discussed in Section XXII.

In the final analysis, however, Helton conceded that the revised H-I model does provide a "rough idea" of the impacts of well pumping:

> "With respect to well pumpage, your Honor, I believe the H-I model does give a rough idea of impacts from well pumpage. But I think that rough idea is valid only on a long-term average." RT Vol. 115 at 51.

An anomaly in the case is that the Colorado water budget analysis actually shows greater depletions from pumping than the revised version of the H-I model. Kansas made one run of the H-I model using Colorado's figures for postcompact pumping, which are almost two million acre-feet less than the estimates on which Kansas bases its claim. The results of that run showed total Stateline depletions of 395,000 acre-feet for the 1950-85 period. Kan. Exhs. 642, 643, 742. This total compares to Colorado's estimate of almost 583,000 acre-feet of depletions for the same amount of pumping.

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[94] Helton outlined the errors claimed in some detail. RT Vol. 133 at 102-115.

Colorado does not dispute the comparison.[95] Rather, it tries to blunt the impact by arguing that the causes of the depletions and the conclusions to be drawn from the Colorado analysis are very different. I cannot see that the causes are different. Both studies show the impact on Stateline flows caused by postcompact pumping only, and the amount of that pumping is the same in both of the analyses.

As to the conclusions to be drawn from the Colorado evidence, Colorado points to the opinions of its experts that depletions from pumping upstream of John Martin Reservoir were largely offset by return flows from transmountain imports, and that downstream of John Martin depletions were either absorbed by the Colorado ditches or effectively offset by benefits from the 1980 Operating Plan. These conclusions raise possible defenses now, and later may be important in any remedies phase of this case. However, Kansas' point is that the revised H-I model, despite the pounding it has received, produces more conservative results than Colorado's own evidence. Colorado's "conclusions" deal with possible offsets, but do not alter the amount of depletions at the Stateline. Kansas' argument appears well taken, even though it goes too far in claiming that criticisms of the H-I model are thus made "irrelevant." Kan. Answer Br. at 22.

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[95] In its post-trial briefs Colorado acknowledges "that the Colorado analysis shows higher depletions than the results calculated by the H-I Model, as revised [by] the Kansas replacement experts." Colo. Response Br. at 77, 93-94.

D. Results of Revised H-I Model.

The results of the revised H-I model are shown on Kansas Exhibit 111*** and 565***. The latter exhibit provides monthly data which are summarized in Kan. Exh. 111***. A copy of Kansas Exhibit 111*** is included in the Appendix as Exhibit 11.

The depletions shown in Kansas Exhibit 111*** represent total depletions of Stateline flows over the period 1950 to 1985.[96] Moreover, they are depletions of usable flows. What constitutes "usable" flow was determined on the basis of an analysis prepared by Spronk Water Engineers ("SWE" or "Spronk") and presented as part of Kansas' replacement case. RT Vol. 100 at 12 *et seq.* The methodology used by SWE is different from that originally employed by Durbin and results in larger depletions. This issue is fully discussed in Section XXI. The depletions of usable flows do not include any accretions. This issue is also taken up later.

The revised H-I model calculates depletions to usable Stateline flows of 620,000 acre-feet resulting from post-compact pumping in Colorado. This figure does not take into account any offsets resulting from the return flows from transmountain imports. RT Vol. 89 at 76. If such offsets are considered, depletions to usable flows from

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[96] Kansas Exhibit 111*** also includes an estimate of increased depletions caused by "future pumping." This calculation is disregarded here. It assumes a continuation of pumping without regard to appropriate remedies if liability is confirmed. RT Vol. 89 at 72-74.

pumping are reduced to 464,000 acre-feet. Kan. Exh. 651; RT Vol. 90 at 8.

The model shows that depletions from the Winter Water Storage Program considered by itself amount to 40,000 acre-feet. This amount does not reflect any offset for transmountain water. RT Vol. 89 at 76.

The "combined effects" condition tabulated on Kansas Exhibit 111*** represents the depletions caused by both postcompact pumping and the WWSP. Kansas experts determined that it was necessary to analyze the effects of these two changes together because of the potential for interaction between them. Kan. Opening Br. at 101. The combined effect of the two institutional changes proved to be less than the sum of the two analyzed separately. *Id.*; RT Vol. 100 at 21. In addition, this analysis includes an offset for transmountain return flows. RT Vol. 89 at 72. The net amount of depletions of usable Stateline flows under these conditions is determined by Kansas to be 489,000 acre-feet.[97] This appears to be the amount of the Kansas claim,[98] although Kansas has indicated that the appropriateness of any offset due to return flows from transmountain deliveries should be reserved to the remedies phase of the trial. Kan. Letter of 9-3-93 at 10. Moreover, Kansas states that

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[97] If the determination of usable flow is based upon the methodology employed by Durbin, as modified by Larson, depletions from the combined effects of pumping and the WWSP are reduced to 365,400 acre-feet. Colo. Exh. 975; Kan. Exh. 560**; RT Vol. 100 at 11, 15; RT Vol. 99 at 126-42.

[98] See Kan. Opening Br. at 115, 128. This amount is the only finding of depletions of usable flows that Kansas has requested.

the "actual violation" of the compact from pumping is 620,000 acre-feet, that is, the total depletions without acknowledging any offset from transmountain return flows. Kan. Letter of 8-24-93 at 5.

The compact does not cover transmountain imports, and Kansas has acknowledged that it makes no claim to such water. However, the return flows from such imports do add to the Arkansas River supply and do act to offset depletions caused by use in Colorado. We have no assurance that such imports will always continue, nor that the return flows therefrom will remain the same. Yet to the extent that return flows from transmountain imports have actually provided an offset to depletions in the postcompact years, I believe that such evidence is not only relevant now, but is also required.[99]

Kansas did not offer any direct evidence apportioning the 489,000 acre-feet of depletions as combined impact between groundwater pumping and the WWSP.

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[99] I agree with the position taken by the United States in its September 3, 1993 letter:

> "Our understanding of the common sense meaning of Article IV(D) of the Compact is that it prohibits 'actual' rather than hypothetical depletions. Under this common sense meaning, new development will not violate the Compact, even if it has the isolated potential of reducing stateline flows, so long as any potential depletions are offset or compensated for at the stateline by additional water from other new development or other sources such as transmountain return flows. In other words, there is no Compact violation, and no liability, unless the combined effect of all operations, including new development, results in a material depletion of usable flow."

Indeed, Kansas has indicated that there may not be a way to apportion the combined impact. Letter of 8-24-93 at 5.

E. Use of the 1980 Operating Plan in the Revised H-I Model Runs.

In calculating the revised model results for postcompact pumping alone, Kansas included operations under the 1980 Operating Plan in both runs. Kan. Exh. 111***. But in analyzing the combined effects of pumping and the WWSP, as well as the WWSP by itself, the 1980 Operating Plan was excluded. That is, in both the baseline runs and in the "what if" scenarios, Kansas assumed that the 1980 Operating Plan had not been adopted. *Id.* These exclusions are directly contrary to the assumptions made in Kansas' earlier presentation. Durbin testified to the final Kansas claim based upon the results shown in Kansas Exhibit 112* (12-6-90). (See statement by counsel in RT Vol. 45 at 125.) Comparison "C" of that exhibit represents the combined effects of pumping and the WWSP, and shows depletions of 917,000 acre-feet. Comparison "H" shows the impact of the WWSP alone. Both of these runs in Kansas Exhibit 112* (12-6-90) were based upon the operation of the 1980 plan.

I find no evidence in the record explaining the switch change insofar as the combined effects analysis is concerned, although Mr. Spronk discusses the change for the WWSP alone. RT Vol. 88 at 133-35. It is not clear that Colorado opposes the change, but Colorado does point out that the revised assumptions are inconsistent with Kansas' statement of entitlement. Counsel for Kansas wrote:

> "With respect to releases during the period from 1980 to the present, Kansas claims that it was entitled to the releases that would have been made to Kansas *in accordance with the 1980 Operating Plan* absent the depletions above John Martin Reservoir caused by post-Compact well pumping and the Winter Water Program in Colorado." Kan. Letter of 8-24-93 at 3, emphasis added.

This position does not appear consistent with the revised evidence Kansas relied upon to quantify its claim.

With respect to the change made in the WWSP runs, Spronk attempted to provide an explanation. He said that the 1980 Operating Plan would not exist without the WWSP; that the storage in John Martin Reservoir was a result of the WWSP. RT Vol. 88 at 133-35; Kan. Opening Br. at 96. He then reasoned that if the WWSP were not being operated, the 1980 plan also had to be removed from the "what-if" run. And in order not to have two variables in the comparison, it then had to be excluded also from the historical run. The United States draws the opposite conclusion from the fact that the WWSP is "inextricably tied to the 1980 Operating Agreement and helps to make extra water available to Kansas." U.S. Letter of 9-3-93 at 1. It states:

> "We don't see how Kansas can accept a portion of the WWSP water stored under the 1980 Agreement and at the same time demand the same schedule of inflows that would have occurred had the WWSP not been implemented." *Id.*

As the United States properly notes, the Kansas WWSP analysis relies upon a comparison of two hypothetical

model runs, neither of which actually happened. U.S. Response Br. at 13-14.

Kansas agrees that the existence of the 1980 Operating Plan should be considered in determining the historical conditions to which the revised H-I model is calibrated. RT Vol. 89 at 80. But Kansas argues that the benefits of the 1980 plan were "separately bargained for," and should not be applied to offset the detriments which arise from a compact violation. *Id.* at 80-81. I agree that the benefits of the 1980 plan, as Helton has quantified them or otherwise, may not be used as a defense to the impact of wells drilled downstream of the Buffalo Canal headgate after 1965. Colo. Exh. 1011, Comparison 9; RT Vol. 133 at 68-75. That was not the intent of the resolution approving the 1980 Operating Plan. However, it does not follow, as a modeling technique, that the 1980 plan must be ignored. The plan now affects results for only five years, but looking to the future, it would become increasingly difficult and less reliable to analyze river conditions on the basis of a storage and release pattern that would not actually have existed over an ever growing number of years.[100]

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[100] It is somewhat anomalous, considering the views of the parties, that the actual inclusion of the 1980 Operating Plan in both of the combined effects runs serves to increase the depletions of usable flow calculated by the revised H-I model from 489,000 acre-feet to 496,000 acre-feet. Kan. Exh. 651, Comparison 4. However, when the WWSP is analyzed separately with the 1980 plan in place, accretions have a major impact. The model results show an increase in Stateline flows of 57,000 acre-feet over the 1976-85 period. *Id.*, comparison 3. There was no evidence, however, on the usability of the accretions.

F. Consideration of Accretions.

The concept of accretions to flows in the Arkansas River was introduced by Kansas. This concept recognizes that releases from upstream storage reservoirs, and pumping from groundwater storage, may at times enhance river flows.[101] This is apart from the fact that the overall impact of groundwater pumping or surface storage may deplete Stateline flows. Kansas exhibits showing the results of both the original and the revised H-I model include depletions alone, and also depletions less accretions. E.g., Kan. Exhs. 111* (12-6-90) and 111***. (Under some model runs, accretions exceed depletions and this result is indicated by parentheses or a minus sign.) Both Durbin and Spronk testified, however, that accretions are relatively infrequent. RT Vol. 45 at 74; RT Vol. 89 at 67; Kan. Exh. 565***. The Kansas replacement case exhibits show depletions not only of total Stateline flows but also of usable flows. Depletions of usable flow, however, do not reflect usable accretions if indeed any exist. RT Vol. 89 at 15, 67; RT Vol. 138 at 75-76. This is in spite of the fact that the revised H-I model does offset daily accretions against daily depletions within the same month.

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[101] Larson defined accretions as follows:

"An accretion is a situation where the state line flow in the alternate condition – that is, the alternate institutional condition – is higher than the state line flow in the original condition. So there is an increase in the state line flow as a result of this for that particular month, rather than a decrease which would be a depletion." RT Vol. 128 at 6.

Kansas properly seeks protection against an averaging process that would allow depletions to be offset by later accretions that might not be usable because of amount or timing, or might simply come too late to compensate for earlier injury. Article IV-D of the compact addresses not only quantity but also protects the "availability for use" of Stateline flows. But this is not to say that accretions should always be disregarded. In its Reply Brief at 81, Kansas takes the view that it would be inconsistent with Article IV-D to offset accretions because the compact prohibits depletions only. I do not agree with that interpretation of the compact. The compact was never meant to regulate the myriad of activities in Colorado that can both add to or subtract from the water in the Arkansas River, except to require that the net result of such development will not materially reduce the usable flow at the Stateline.

Whether accretions may appropriately be considered as an offset to depletions requires an analysis of each particular situation. RT Vol. 113 at 15-17. However, there was little effort by the parties to see if any individual accretions were in fact usable and could properly reduce depletions. In part, this may have been due to the fact that the impact from pumping was not much different whether depletions alone were considered, or depletions less accretions. Colo. Exh. 1012; RT Vol. 138 at 80. The Colorado water budget analysis showed only small accretions due to pumping. Kan. Exh. 643.

Accretions produced by the revised H-I model result primarily from the logic used in reservoir operations. RT Vol. 111 at 149; RT Vol. 138 at 73, 78. The timing of both depletions and accretions is an artifact of the modeling

process,[102] and is not likely to be exactly replicated in actual operations. For this reason alone, it may be extremely difficult to determine whether accretions calculated by a model should be used to reduce depletions. However, that issue needs to be examined.

G. Conclusions.

Based upon all of the evidence in the case, including the Colorado water budget analysis discussed in Section XX, and regardless of which burden of proof applies, I have no difficulty in concluding that postcompact pumping in Colorado has caused material depletions of the usable Stateline flows of the Arkansas River, in violation of the Arkansas River Compact. The total amount of such depletions over the 1950-85 period is much more difficult to determine. If my conclusion on liability is confirmed by the Supreme Court, then, to refine the total amount of depletions, additional evidence will be required during the remedies phase of the trial.

This conclusion relates only to postcompact pumping in Colorado, and not to the Winter Water Storage Program. The impact, if any, of that program is discussed in Section XXII hereof.

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[102] Releases from John Martin Reservoir, for example, are in part dependent upon the numbers used in the model to simulate monthly demand by Kansas. These numbers reflect some averaging and calibration techniques, and do not vary in the short term with weather or crop conditions. RT Vol. 111 at 23-39, 145-47; RT Vol. 112 at 49-50; RT Vol. 138 at 73-74, 78.

SECTION XX

COLORADO WATER BUDGET ANALYSIS

Counsel for Colorado described its water budget analysis as being at once "both simpler and more complex than the hydrologic-institutional model." RT Vol. 59 at 27. While Colorado generally referred to its approach as a water budget, it actually embraces four integrated models. It involves an analysis of the river system in two separate reaches. The portion between Pueblo and John Martin Reservoir was identified as Reach 3, while the downstream area between John Martin Reservoir and the Stateline comprised Reach 4. For each of these reaches, Colorado developed a separate groundwater model and a water budget model. The data used in Colorado's water budget, and the results, are found in Colorado Exhibit 4*.

Overall, Helton testified that "there has been some impact on state line flows as a result of post-compact pumping." RT Vol. 115 at 62. Above John Martin Reservoir, the impacts in his opinion have been largely offset by the return flows from transmountain imports. *Id.* Below John Martin Reservoir, Helton believes that the impacts have resulted largely from wells constructed downstream of the Buffalo Canal headgate. *Id.*

The groundwater models were used to estimate return flows and the effects of groundwater pumping. Groundwater withdrawals and recharge to the groundwater system were estimated using the water budgets, and that information was passed to the groundwater models. The groundwater models then calculated stream-aquifer interactions, drain flows and changes in groundwater storage. These data were then passed back to the

water budget models to calculate ungaged tributary inflows.

The Colorado water budget analysis cannot be directly compared with the results of the revised H-I model. RT Vol. 127 at 115-16. Colorado does not predict streamflows and diversions as Kansas does. Instead, the Colorado process starts with actual historical diversions, and then estimates the increase or decrease in streamflow that would have occurred under different hydrological or institutional conditions. The river gains or losses are then allocated according to historic demands and rights. The unknown in the Colorado analysis, that is, the residual for which the process solves, is the amount of ungaged tributary inflow. RT Vol. 101 at 33, 43.

The groundwater models are calibrated against well levels, but since the process does not produce predicted streamflows, the final results cannot be compared against measured flow of the river or the output of the revised H-I model. RT Vol. 127 at 70. Nonetheless, Larson did not believe that the differences between the Colorado and Kansas approaches were necessarily significant. RT Vol. 99 at 60-61.

From the outset, Colorado emphasized the need for a more complete and accurate data base for use in the modeling effort. Colorado Attorney General Gale C. Norton, in her opening statement, outlined the data deficiencies and the state's determination to obtain the best and most accurate data possible.[103] RT Vol. 59 at 9. She

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[103] Larson also testified to the lack of historical data, namely, pumping records, the distribution of pumping,

pointed out that the state government had a responsibility to all Colorado water users, some of whom were also being injured if the allegations of Kansas were correct. *Id.* at 10. In order to obtain an adequate scientific basis for decisions, she said: "We chose to place our resources in an effort to develop the best data that we could." *Id.* at 10.

Colorado did, indeed, spend much effort in collecting new data, and verifying and sometimes correcting old data. Much of this work is discussed in the testimony of Hal Simpson, then the Deputy State Engineer, Division of Water Resources.[104] RT Vols. 67, 68. The basic data collection effort included aerial photos and field studies to determine irrigated acreage; a field inventory of wells; reviewing and revising diversion data; tabulating water rights; locating ditch laterals and drains on maps; and making certain flow measurements. Toward the end of the trial, Colorado produced a number of useful exhibits comparing the data sets used by Colorado in its water budget analysis and the data used by Kansas in the revised H-I model.

A. Common Data.

Helton was the expert who testified to this series of comparative data exhibits. RT Vol. 113 at 100 *et seq.*; RT Vol. 114. In his opinion, the differences between the states

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ungaged tributary inflow, off-stream reservoir storage, winter consumption and evaporation, and use by phreatophytes. RT Vol. 127 at 63-65.

[104] Mr. Simpson is now the Colorado State Engineer.

were not significant with respect to the following data sets: upstream inflow, Colo. Exh. 831; transmountain deliveries, Colo. Exh. 846;[105] winter storage accruals in Pueblo Reservoir, Colo. Exh. 847; winter storage releases from Pueblo Reservoir, Colo. Exh. 848; rainfall comparisons, Colo. Exh. 855; assignment of climatic stations for rainfall and evapotranspiration ("ET"), Colo. Exhs. 856, 857; crop data, Colo. Exh. 859; and crop water requirements, Colo. Exh. 860.

B. Significant Differences in the Data Sets Employed by the Two States.

According to Helton there were significant differences in the data sets used by the two states in other areas: precompact pumping allowance, Colo. Exh. 993; total pumping, Colo. Exhs. 822, 852; ungaged tributary inflow, Colo. Exh. 837; certain annual diversions, Colo. Exhs. 838, 839; crop consumptive use, Colo. Exh. 862; and consumptive use by phreatophytes, Colo. Exh. 864.

My analysis of the pumping data appears in Sections XV and XVI and is not further discussed here. Some of the data disputes over the Winter Water Storage Program are also included elsewhere in Section XXII. Other basic data issues, however, are covered in the subsections that follow. Kansas' experts were of the view that for purposes of modeling Stateline depletions, the important

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[105] For the 1950-85 period, the revised H-I model used a total of 2,176,006 acre-feet of total transmountain imports. Colorado's slightly revised total was 2,023,576 acre-feet. RT Vol. 114 at 7-13.

differences in data relate to pumping and to ungaged tributary inflow. RT Vol. 99 at 118-19.

C. Irrigated Acreage in Colorado.

Both states calculated irrigated acreage from aerial photographs. Colorado relied on ASCS[106] photos from 1947, 1953-54, 1962-64 and 1970, and on 1985 photos taken on a special flight arranged by the Colorado state engineer. Colorado assumed linear trends between the various sets of photos, and results were also compared with a 1939 study by the Colorado Water Conservation Board. Moreover, Colorado conducted a land use study in 1985 to provide "ground truth" for the interpretation of the aerial photos. RT Vol. 59 at 19.

Kansas based its calculations on two ASCS sets of aerial photos, using 1957 photos for the 1950-69 period, and 1980 photos for 1970-85. It had little practical access for making detailed field studies. Nonetheless, the Colorado and Kansas figures for average irrigated acreage in Colorado over the 1950-85 period are remarkably close. Colo. Exhs. 827, 828, 829, 830. The amount was approximately 319,000 acres, which compares to a total of approximately 317,000 acres at the time the compact was made. Colo. Exhs. 829, 830.

Colorado argues, however, that Kansas did not make the same detailed analysis which Colorado had made in locating the amount of acreage served by each canal

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[106] Agricultural Stabilization and Conservation Service.

system. As a result, Colorado claims there were inaccuracies in the amounts of irrigated acreage assigned to individual ditch systems used in the H-I model. RT Vol. 113 at 101-110. Colorado attributes part of the H-I model's problems to this allocation, and to the assumption that greater accuracy was not required in determining where water was used because the river basin could be modeled as a linear system.

Both states show a small decline in total irrigated acreage when comparing 1950 with 1985. For Kansas, the reduction is a little over 3,000 acres. For Colorado, the amount is about 14,000 acres, most of which reflects a sharp decline between the 1980 ASCS photo results and Colorado's own 1985 flight results. Colorado says the reduction is due primarily to the conversion of certain irrigation water rights to municipal use. Colo. Closing Well Br. at 17-18. The municipal use of Arkansas River water is relatively small, and was not an issue in this case. However, aside from any change from irrigation to municipal use, a reduction in irrigated acreage does not necessarily mean a reduction in the use of water. The system is water short. Agriculture in Colorado needs more water than the river generally provides. Pumping has partially met that need and has increased the overall use of water in Colorado. Comparing early postcompact years (1950-65) with the later period (1966-85), total supply has increased in Reach 3 from 3.21 acre-feet per acre to 3.69 acre-feet. And in Reach 4, the increase has gone from 2.15 to 2.58 acre-feet per acre. Computed from Colo. Exh. 4*, Tables 5.5 and 5.12, Col. 10.

Looking at the two reaches of the river, both states show that a reduction in irrigated acreage has occurred in

Reach 3, upstream from John Martin Reservoir. On the other hand, in Reach 4 between John Martin Reservoir and the Stateline, irrigated acreage has increased between 10,000 and 12,000 acres since 1950. Colo. Exhs. 827-30. Increased water use in Reach 4, of course, has the most direct impact on Stateline flows. Total water requirements (April through October) for irrigating approximately 319,000 acres in both reaches were estimated by Colorado to be 820,000 acre-feet and by Kansas to be 798,824 acre-feet. Colo. Exh. 860.

D. Surface Diversions in Colorado.

Diversions from the surface flow of the Arkansas River by the various canal companies in Colorado have long been measured and the results published. These data, however, were carefully reviewed by Colorado for purposes of this action and certain corrections were made. I believe they now represent the most accurate information available. Kansas continued to use the diversion figures maintained and published by the Arkansas River Compact Administration, but its results are nonetheless quite similar to those of Colorado. Average annual diversions for the 1950-85 period, as computed by Colorado, amounted to 884,881 acre-feet. The Kansas data, collected by Spronk Water Engineers, averaged 887,612 acre-feet. Colo. Exhs. 838, 839.

Kansas, however, did not use these diversion figures as input into the H-I model. Instead, it designed the model to *predict* such diversions. This was to allow diversions to vary according to changing amounts of assumed pumping. Actual measurements of diversions were then

used to check the accuracy of the model's predictions. Historic diversions, as calculated by the revised H-I model for 1950-85 averaged 923,415 acre-feet annually. *Id.* To some extent, these figures bear out Schroeder's conclusion that the H-I model has a chronic problem of overpredicting diversions.

The Colorado water budget used actual diversion figures, but then changed them in accordance with estimated gains or losses in river flow based upon changes in pumping. Thus, the Colorado analysis dealt with changes in flow rather than with the total amount of flow. This approach has the advantage, according to Colorado experts, of confining any model error to a smaller portion of the total river flow. However, it also has the disadvantage of not being able to test the water budget results against Stateline flows.

Diversions have increased somewhat in the postcompact years, although transmountain imports have also increased. During the compact negotiations, the engineering committee submitted a report showing that diversions in Colorado over the 1908-42 period had averaged 857,200 acre-feet annually. Jt. Exh. 5 at 20. Based on Colorado's figures, the average for 1950-85 was 884,881 acre-feet. Colo. Exhs. 838, 839. However, the 1950-85 average includes diversions of imported water while the 1908-42 calculation does not. Without consideration of the diversion of transmountain imports, there has been a slight decrease in diversions of about 28,000 acre-feet annually. Kansas argues that the decline is more than offset by increased pumping.

E. Inflow from the Purgatoire River.

The Purgatoire is the largest tributary of the Arkansas River in Colorado and there was some suggestion that the decline in Stateline flows was due in part to reduced inflow from the Purgatoire. Both states relied for their measurements upon the USGS gage on the Purgatoire near Las Animas. For the 1950-85 period, inflow to the Arkansas River averaged 61,659 acre-feet annually. Colo. Exh. 836; Kan. Exh. 50*. Comparing early and late compact years, the 1950-64 period averaged 65,301 acre-feet per year, while the 1965-85 period averaged 48,447 acre-feet.[107] Thus, the measurements show a small decrease in flow, although the early 1950-64 average is heavily influenced by flood flows in a single year, namely, 1955; total flows in 1955 amounted to 232,368 acre-feet. It is also important to note that the models of both states took the Purgatoire flows into account, and isolated Stateline depletions caused by pumping and the WWSP only.

F. Ungaged Tributary Inflow.

Estimating the inflow from ungaged tributaries to the Arkansas River proved to be a difficult problem for all of the experts. Some tributaries have flow measurements for certain years only, but others have no flow records at all. Jt. Exh. 94 at 9-13. One of Colorado's experts, Dr. Young

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[107] This comparison omits the flood year of 1965, during which flows were 271,256 acre-feet.

Yoon,[108] at first attempted to apply a rainfall-runoff model to estimate ungaged tributary inflow, but concluded that the rainfall data were insufficient for this approach. RT Vol. 73 at 46. A rainfall-runoff model depends upon developing a reliable correlation between precipitation and the resulting runoff. Here, Dr. Yoon concluded, the scarcity of rainfall stations[109] and the erratic nature of the precipitation[110] precluded such a model. RT Vol. 101 at 36. Colorado ultimately made ungaged tributary inflow the residual in its entire water budget analysis, and used that process to solve for such flows. For the 1950-85 period, Colorado calculated that the total ungaged tributary inflow in Reaches 3 and 4 averaged 182,865 acre-feet per year as corrected. Colo. Exh. 837; Colo. Exh. 4*, A.1 and B.1, Col. 6.

The Kansas estimate was substantially lower, namely, 86,571 acre-feet. The Kansas figures came from Durbin's rainfall-runoff model which developed a relationship between precipitation and runoff derived from watersheds with some gaged streamflow records. RT Vol. 42 at 65. Such annual flows were then processed by a special version of the H-I model (sometimes referred to as "GLOBAL") in order to determine monthly values and to match observed streamflows. RT Vol. 42 at 56-58, 72. This

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[108] His qualifications are found in Colo. Exh. 671. His initial assignment was to develop water budgets for the two reaches. RT Vol. 101 at 79.

[109] There were 16 rain gage stations located throughout the tributary basin areas. RT Vol. 101 at 64, 74.

[110] Dr. Yoon testified that most of the rain came in the form of thunderstorms. RT Vol. 73 at 78-79.

monthly adjustment step was dropped by Kansas' replacement experts. Larson testified that it was not necessary, and that the rainfall-runoff model results could be appropriately inserted as direct input into the revised H-I model since overall the model achieved sufficient calibration based on streamflow and diversion data without further adjustments. RT Vol. 100 at 79.

Colorado claims that the Kansas methodology[111] underestimates ungaged tributary inflow, and Larson testified that this might be true, although no amounts were given. RT Vol. 100 at 79-80. However, there is also persuasive evidence that the Colorado figures for ungaged tributary inflow may indicate problems with the Colorado models, and may be too high.

The Colorado water budget analysis accumulates in the results calculated for ungaged tributary inflow any model errors that occur. RT Vol. 127 at 105. And there is indication of such errors. RT Vol. 101 at 75-77. The Colorado models produced what the engineers called "negative" tributary flows, that is, according to the models water sometimes flowed uphill into the tributaries rather than toward the Arkansas River. RT Vol. 101 at 67-69. This meant that the models were calculating too much water. The excess could not be added to the Arkansas River because those downstream flows are specified and fixed in the Colorado models. So, as Larson put it, "you have to

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[111] The parameters used in Durbin's rainfall-runoff model were derived from an analysis of Horse Creek data, and there was uncontroverted evidence that the gage measurements on this creek may have been affected by upstream diversions. RT Vol. 100 at 80.

send water up the tributaries in order to balance the water budget." RT Vol. 127 at 106. Negative flows occurred in Reach 4 in some 70 to 80 months during the 1950-85 period. RT Vol. 101 at 68-69. While Colorado always emphasized the soundness of the data used in its water budget analysis, the models also included some 27 parameters or coefficients that were not field measured, but were estimated on the basis of local experience, judgment or handbooks. RT Vol. 102 at 14. To Larson, the negative tributary flows indicated potential problems and that adjustments were needed within the water budget portion of the Colorado analysis. RT 127 at 107, 112.

Larson also plotted actual measured flows from Big Sandy Creek for the years 1968-82 against the amounts of flow calculated by the Colorado water budget. Kan. Exh. 694. The Big Sandy watershed includes about 60% of the tributary areas in Reach 4. RT Vol. 127 at 110. The calculated flows for these years are substantially in excess of the measured flows for the same years. Larson concluded overall that there were indications that Colorado's ungaged tributary inflows "may be too high." RT Vol. 127 at 113.

Dr. Yoon initially indicated that ungaged tributary inflow declined during the 1970s. On cross-examination, however, he acknowledged that if the single month of June, 1965 were removed from the comparison, the decline would be hydrologically insignificant. RT Vol. 102 at 45, 48, 52-53.

Mr. Durbin did not believe that close accuracy in estimating ungaged tributary inflow was critical. Since such flow represented only a small portion of total flow,

and since the same figures were used in both runs of each pair of comparative runs of the H-I model, he testified that any error would have little impact on the use to which the model was being put. RT Vol. 46 at 97-98, 117; RT Vol. 47 at 37. Colorado, however, points out that the adjusted tributary inflows were used in the H-I model to calibrate the values of nonbeneficial consumption of applied surface water and tailwater runoff. In turn, these factors were used in the calibration of the WANT factors to predict diversions.

It is not possible to determine with accuracy what the ungaged tributary inflows may have been over the years. The best estimate is likely to fall somewhere between the amounts calculated by the two states. However, it does not appear that this factor is critical to the revised H-I model. On rebuttal, Larson produced a series of "sensitivity" runs. Kan. Exh. 691. In one of these runs he used ungaged tributary inflow values that were more like those derived by Colorado. The result was to decrease depletions, but not by a major amount. *Id.*, Comparison 5. This change put the model out of calibration. When Larson adjusted the noncrop ET coefficients in the model in order to bring it back into approximate calibration, the depletions were essentially the same as those originally shown by the revised H-I model. *Id.*, Comparison 6; Kan. Exh. 111***; RT Vol. 127 at 91-92.

G. Consumptive Use by Phreatophytes.

The experts for both states agreed that the consumptive use of Arkansas River water by phreatophytes[112] had increased over the postcompact years. The three major upstream dams and reservoirs have reduced the high flood flows that used to scour the river channel. Undoubtedly, the increased use of river water by natural vegetation in Colorado has had some impact on Stateline flows, but Kansas makes no claim based on any such depletions.

The Kansas expert witness was Dr. David P. Groeneveld, a consulting plant ecologist who specializes in the study of phreatophytes.[113] RT Vol. 24 at 83, 90-91. Colorado used Robert A. Longenbaugh, an assistant state engineer, Colorado Division of Water Resources, and former associate professor at Colorado State University. Mr. Longenbaugh has testified as an expert witness on many previous occasions but never before had qualified as an expert on phreatophytes. RT Vol. 62 at 81-82. His experience in mapping and determining the consumptive use of phreatophytes did appear to be somewhat limited.[114]

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[112] Defined as plants that receive all or part of their water from groundwater. RT Vol. 24 at 116. More commonly, phreatophytes are thought of as natural riparian vegetation. Along the Arkansas River "woody" phreatophytes include salt cedars, cottonwoods and willows. "Herbaceous" phreatophytes include kochia, saltgrass, cattails and other grasses.

[113] His curriculum vitae is Kansas Exhibit 487, and includes considerable experience in using aerial photography to map vegetation.

[114] His qualifications appear in Colorado Exhibit 664.

Both experts relied extensively on two prior reports, one published by Bittinger and Stringham in 1963,[115] and one by Lindauer and Ward in 1968.[116] RT Vol. 24 at 106; RT Vol. 62 at 109, 117. Bittinger estimated the consumptive use of phreatophytes from Pueblo to the Stateline to be about 65,900 acre-feet annually, with an accuracy within 20%, plus or minus. Jt. Exh. 61, Table 9 at 20; RT Vol. 26 at 28, 60. Lindauer mapped the vegetative cover but did not actually estimate consumptive use.

Dr. Groeneveld attempted to determine what changes, if any, had occurred since the Bittinger report. RT Vol. 24 at 136. He concluded that use by phreatophytes had increased by about 14,000 acre-feet annually over Bittinger's 1957 estimate, reaching a total of 79,424 acre-feet in 1983. Kan. Exh. 526. He agreed that there was also a range of error in this estimate and that the increased use might be as low as 10,000 or as high as 19,000 acre-feet. RT Vol. 26 at 81. Most likely, however, he thought the range was between 12,000 and 16,000 acre-feet. *Id.*

Groeneveld employed accepted techniques comparing the 1957 aerial photos used by Bittinger with a set of 1983 color, infrared aerial photographs. Transects across the river were established at 80 locations between Pueblo and the Stateline. (Bittinger had used only 18.) RT Vol. 24 at 121; RT Vol. 26 at 41. The type of vegetation and the percentage of ground covered by such vegetation were determined along each of these transects. In this process,

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[115] Jt. Exh. 61.

[116] Jt. Exh. 62.

Groeneveld used a stereoscope which magnifies depth perception and provides three-dimensional viewing of the aerial photography. Evapotranspiration rates ("ET"), which are available in the literature for each type of vegetation, were then applied to the percent of coverage and area in order to reach an acre-feet figure for consumptive use. RT Vol. 24 at 127-28. The Kansas study of phreatophytes was limited to the flood plain of the river.

A recent report[117] of the United States Department of Agriculture, done in cooperation with the Colorado Water Conservation Board, produced an estimate fairly close to Groeneveld's figure. Jt. Exh. 108. The report separately estimates consumptive use by phreatophytes in five reaches of the river between Pueblo and the State-line, giving a total of 72,900 acre-feet. *Id*, Table A-14 at A-36.

Mr. Longenbaugh's estimate for the increase in consumptive use between 1957 and 1983 was 31,718 acre-feet compared to Groeneveld's estimate of 14,000. Colo. Exh. 786. However, Longenbaugh's initial base from which he calculated the increase was considerably higher. As a result, Longenbaugh estimated that consumptive use by phreatophytes averaged 123,876 acre-feet annually over 1950-85. Colo. Exh. 864. The comparable Kansas figure was 70,580. *Id*. While Longenbaugh did not testify to a specific range of error in his estimates, there is evidence to indicate that his figures were less reliable than those developed by Kansas.

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[117] The study was authorized in 1979, but the report does not bear a date. Colorado's counsel, however, believes that it was published in 1986. RT Vol. 63 at 22.

To begin with, Longenbaugh used George Moravec's[118] 1985 black and white aerial photos and mylar overlays to determine the boundaries of the area where phreatophytes were located, and the amount of acreage involved. RT Vol. 62 at 107; RT 63 at 81. Moravec determined that in 1985 there were 29,519 acres of woody phreatophytes between Pueblo and the Stateline, and 13,026 acres of herbaceous phreatophytes. Colo. Exh. 487, Table 1 at 8; RT Vol. 62 at 159. This acreage was also confined to the floodplain of the river. RT Vol. 61 at 68.

Moravec testified that he established his boundaries in the same manner as Bittinger. RT Vol. 61 at 71, 81-82. However, Bittinger did not map any boundaries for herbaceous phreatophytes. RT Vol. 63 at 105, 116. Nor did Lindauer. *Id.*; RT Vol. 64 at 94; Jt. Exhs. 61, 62. Indeed, Moravec provided no good explanation as to how the boundaries for herbaceous phreatophytes were established, and how he distinguished herbaceous phreatophytes from the nonphreatophytic cover in the surrounding upland areas. Some of his herbaceous acreage extended a half mile or more from the river, and included areas where the groundwater levels appeared to be too far below ground surface to supply any herbaceous phreatophytes. RT Vol. 64 at 41-45; RT Vol. 63 at 114; Colo. Exh. 685.

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[118] Mr. Moravec is a hydrogeologist with the Colorado Department of Health, and previously was with the Colorado Division of Water Resources. He has had practical experience with aerial photos and in using them to map irrigated acreage and vegetation, but no formal education in plant ecology. His qualifications are found in Colorado Exhibit 666.

Accepting the Moravec boundaries and acreage, however, Longenbaugh then assumed that this total amount of acreage, for both woody and herbaceous phreatophytes, had remained constant throughout all years since 1950. RT Vol. 63 at 138. To develop the herbaceous acreage for earlier years, he increased such acreage backwards in time by taking the difference between the amount of total acreage and the amount assigned in each of those earlier years to woody phreatophytes. *Id.* at 106, 137. I find no support in the evidence for these assumptions. They result in much greater phreatophytic acreage than the well accepted Bittinger and Lindauer reports calculated, and account for much of the higher consumptive use figures developed by Colorado. To determine the consumptive use of herbaceous phreatophytes, Longenbaugh also assumed that the cover was 100 percent. *Id.* at 181.

The actual consumptive use for herbaceous phreatophytes in 1985 was calculated to be 3.91 acre-feet per acre in Reach 3 above John Martin Reservoir, and 3.58 acre-feet downstream in Reach 4. Colo. Exh. 438*. These amounts were based upon a curve developed by Longenbaugh that relates the amount of consumptive use by herbaceous phreatophytes to the depth to groundwater. Colo. Exh. 679*. This curve shows that groundwater must be within one foot of the surface of the ground for herbaceous phreatophytes to consume 3.91 or 3.58 acre-feet per acre. RT Vol. 64 at 36-37. Colorado's groundwater models calculated these sensitive depths to water and applied the curve in Colorado Exhibit 679* in order to arrive at the consumptive use figures. RT Vol. 63 at 111-12, 136; RT Vol. 64 at 45. Longenbaugh expressed

confidence that the groundwater models provided the "right answers." RT Vol. 64 at 45.

However, actual well measurements, not model output, indicated otherwise. Of 27 wells located along and near the river, only four showed water levels within a foot of the ground surface. Colo. Exh. 685. Longenbaugh attempted to justify the 3.91 and 3.58 consumptive use figures on the ground that they were averages of some high areas of use[119] and other areas where the consumption was zero. RT Vol. 64 at 54-55. However, Colorado had no quantitative data in the areas of such high use vegetation, and to acknowledge areas of no consumptive use would indicate that Moravec's boundaries and acreage were incorrect.

Other questions could be raised about the Colorado estimates,[120] but perhaps this is sufficient. Certainly the water use by native vegetation over 150 miles of river and for a 36 year period cannot be determined with precision. However, it is not clear how significant the differences between the estimates of the states are for modeling purposes. This was not an important issue in the post-trial briefs of the parties. Nonetheless, to the extent that

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[119] For example, cattails at 5.7 acre-feet per acre.

[120] For example, the percent of cover used in the calculations for woody phreatophytes was largely the result of subjective judgment rather than any scientific methodology. RT Vol. 63 at 80, 87-88, 142-44; RT Vol. 64 at 85. Longenbaugh's percentage substantially increased the earlier Bittinger and Lindauer estimates, and contributed heavily to his final consumptive use estimates. His approach can be contrasted with Groeneveld's direct analysis of 80 representative transects of 1983 aerial color photos.

consumptive use by phreatophytes can significantly affect the modeling of Stateline depletions, I find that the Kansas estimates are most likely to reflect actual use.

H. Results of Colorado Water Budget Analysis.

The impacts of postcompact pumping in Colorado on Stateline flows as derived from the Colorado water budget analysis can be found in Colorado Exhibit 135*, p. 6.1, col. 16. The results for the 1950-85 period are not immediately apparent since the exhibit does not provide totals. However, Helton confirmed that total depletions to Stateline flows for the full 1950-85 period amount to 582,696 acre-feet. RT Vol. 134 at 13; RT Vol. 117 at 75, 102.

These results are derived from what Colorado called its "What-if 2" scenario. In that analysis, Colorado made one model run based on historical conditions. In that run total pumping averaged 145,199 acre-feet annually, which is the amount estimated by Colorado. Colo. Exh. 135* at 1.1. Colorado then paired the historical run with a second model run in which pumping levels were held to the so-called precompact amounts. The precompact allowance averaged 49,275 acre-feet annually. Thus, the What-if 2 comparison registered the impact on Stateline flows of the difference between Colorado's view of allowable precompact pumping and later total pumping, namely, an average of 95,925 acre-feet annually for the 1950-85 period. RT Vol. 133 at 53-54. This is comparable to an annual average of 150,394 acre-feet which Kansas used in determining Stateline depletions from postcompact pumping. Kan. Exh. 731.

The Colorado figure of 582,696 represents depletions caused by postcompact pumping in Colorado in terms of total Stateline flows, not usable flows. RT Vol. 134 at 14. Colorado presented no evidence of its own on depletions of usable flow after the year 1969.[121] Colo. Exh. 135*, pages 7.1-7.3. According to Helton, there was not an adequate basis for making a determination of usable flow in the absence of records from the gaging station at Garden City. RT Vol. 134 at 14; RT Vol. 117 at 101-02. From 1970 through 1986 the gage was maintained only for flood flows, although continuous recorder charts remained in place which reflected water levels at the gage. Kansas later used these data to estimate daily flows past Garden City; any such flows were considered by Kansas to be unusable.

While Colorado introduced no evidence reducing the 582,696 acre-feet of depletions of total flow to depletions of usable flow, Kansas did make such an effort. Larson testified that this amount translated into 411,000 acre-feet of depletions of usable flow. RT Vol. 127 at 94. In making this calculation, Larson applied the Spronk method of determining usable flow. The validity of this approach is discussed in Section XXI.

Colorado's depletion figure of 582,696 represents Stateline depletions which still remain *after* deleting the effect of return flows from transmountain imports. RT Vol. 134 at 14; RT Vol. 115 at 75; Colo. Letter of 8-24-93 at

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[121] Helton did, however, critique the Kansas evidence on usable flows which covered the full 1950-85 period. He also proposed different coefficients if the Kansas methodology were to be used. This subject is covered more fully in Section XXI.

11. Helton testified that the results of the Colorado water budget were reasonable on a monthly basis, more accurate on an annual basis, and "more accurate yet" on a long-term average. RT Vol. 117 at 100.

While Colorado's depletion figure is high because not reduced to usable flows,[122] it is also low in two other respects. First, the assumed amount of postcompact pumping is not sufficient; this issue is treated in Section XV. Second, the Colorado analysis offsets what has been termed the "clear water effects." The construction of Pueblo Dam reduced the amount of silt in the river. In turn, this increased seepage in the upstream canals and laterals, particularly in the Bessemer system. Helton testified that farmers were thus required to pump more water in order to obtain the same total irrigation supply. RT Vol. 134 at 16-17.

In Colorado's What-if 2 run, therefore, seepage losses were allowed to increase, thereby resulting in lower calculated depletions at the Stateline. *Id.*, at 22. In essence, Helton treated the pumping increment which offsets these increased seepage losses as part of Colorado's historic water supply, rather than as postcompact well pumping. While the impact is apparently small, I do not

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[122] Colorado maintains that the figure is also high for other reasons. In its "What-if 2" analysis Colorado did not "reoperate" John Martin Reservoir. Had it done so, Colorado states, the depletion amount would have "declined substantially." RT Vol. 142 at 103. Helton also testified that the Colorado analysis did not consider that some Colorado ditches would have exercised their surface rights more frequently if supplemental wells were not available. RT Vol. 117 at 131-33. However, no specific or quantitative evidence was submitted on these points.

believe this is proper. RT Vol. 117 at 70-71. There is no question about the substantial benefits accruing to Colorado from the construction of Pueblo Dam. *Id.*, at 74. Sediment control for the benefit of upstream Colorado ditches was one of the purposes of Pueblo Reservoir. Jt. Exh. 166 at 23, 25, 26. Any burdens from the project must also be accepted.

In an effort to compare the revised H-I model results with those derived from Colorado's water budget, Kansas made one run of its model using Colorado's figures for pumping and an approximation of Colorado's What-if 2 scenario.[123] For the same amount of postcompact pumping, Colorado's own What-if 2 analysis calculated total Stateline depletions of 583,000 acre-feet for 1950-85, while the H-I model run indicated depletions of only 395,000 acre-feet. Kan. Exh. 642; RT Vol. 127 at 93. Kansas points to this comparison to show, despite Colorado's many criticisms of the H-I model, that the revised model actually produces smaller Stateline depletions per acre-foot of pumping than Colorado's own water budget. Colorado does not deny this fact.[124] Rather, it attempts to deflect

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[123] In its What-if 2 scenario, Colorado used the figure of 3,453,000 acre-feet as the difference between its claimed precompact allowance and total pumping for the 1950-85 period. Kansas originally used 5,414,000 acre-feet as its comparable figure on which depletions were based, as shown in Kansas Exhibit 111***. However, in this run of the revised H-I model, Kansas used Colorado's pumping, namely, 3,453,000 acre-feet. Kan. Exh. 642.

[124] "Kansas also asserts that Colorado made many efforts 'to minimize the calculated effects of pumping on the stateline flows.' *Id.* at 74. This assertion has a hollow ring given the fact that the Colorado analysis shows higher depletions than the

the argument, saying that nonetheless the conclusions to be drawn from Colorado's analysis "are very different." Colo. Response Br. at 93.

Colorado refers to Helton's conclusion that transmountain return flows have largely offset the impacts of postcompact pumping above John Martin Reservoir. But this does not explain away depletions at the Stateline of 582,696 after the offset from transmountain flows has been taken into account. Colorado also refers to Helton's conclusion that depletions of Stateline flows were due largely to wells constructed east of the Buffalo headgate after 1965. Again, while this may be useful in any remedy phase of the trial, the location in Colorado of any wrongful pumping, insofar as liability is concerned, does not matter if the result is a compact violation at the Stateline. The cause of the calculated depletions is not in dispute. Both Colorado's What-if 2 scenario and Kansas' H-I model runs were specifically designed to isolate the impacts of postcompact pumping in Colorado on Stateline flows. Colorado's analysis shows that Stateline depletions are equal to 17% of the amount pumped, while the Kansas estimate is only 11.3%. Calculated from Kan. Exh. 642.

Colorado's What-if 2 analysis also carries a column entitled "Potential Impact on Kansas." Colo. Exh. 135*, page 6.1, column 17. This again considers the impact of 3,453,000 acre-feet of postcompact pumping. The column shows an average "potential impact" of 7,755 acre-feet

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results calculated by the H-I Model, as revised [by] the Kansas replacement experts." Colo. Response Br. at 77; see also pages 93-94.

annually for the 1950-85 period, or 279,180 acre-feet for the whole period. It is computed by taking 40% of the change in conservation storage in John Martin Reservoir and adding depletions in Stateline flow from April through October. RT Vol. 134 at 22-23. Depletions occurring from November through March were not included because, according to Helton, those flows "weren't used in Kansas." RT Vol. 115 at 78. Helton testified that these potential impacts were not the same as depletions of usable flow, but would be "further reduced for the times when Kansas did not fully use all of the water that was available there historically." RT Vol. 134 at 23.

I. Colorado's Modifications to the Revised H-I Model.

During the course of the trial, Colorado developed the capability of operating and adjusting the Kansas revised H-I model. Schroeder made a number of changes to the H-I model input and code, including removal of the canal capacity and diversion reduction factors. Colo. Exhs. 1008, 1009. He then attempted to recalibrate the model, and in his opinion achieved a "similar degree of accuracy" to that obtained by Kansas. RT Vol. 138 at 137; RT Vol. 139 at 18; Colo. Exh. 1010. In all, he made some 900 runs, but presented, in Colorado's Exhibits 1011 and 1012, the results of only a limited number of comparisons. RT Vol. 139 at 42. However, he was not prepared to sponsor these results. While he believed that the Stateline depletions shown by his modified H-I model runs were more appropriate than the depletions shown in Kan. Exh.

111***,[125] he still testified that his modified version of the H-I model was "inaccurate, inappropriate, and not a reasonable tool." RT Vol. 139 at 96, 67. None of the results depicted in Colorado Exhibits 1011 and 1012 was an "appropriate quantification," he said. RT Vol. 140 at 97.

Kansas objects strongly to Colorado's modifications of the H-I model, claiming they were "selective." Kan. Answer Br. at 28. However, it seems unnecessary to treat Kansas' criticisms in detail here in view of Schroeder's own testimony that he did not adopt the H-I model results, even with his modifications.

J. Conclusions.

Colorado's own water budget analysis essentially disposes of the issue of liability from pumping, except for possible affirmative defenses. And none of those defenses is asserted as a complete bar to all liability. Laches is raised as to wells constructed prior to 1965, but Colorado's experts have testified to depletions from wells drilled later, below the headgate of the Buffalo Canal, the last canal in the Colorado system. Colorado also asserts that the benefits of the 1980 Operating Plan should offset the depletions caused by wells located below John Martin Reservoir. However, I have already concluded in Section

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[125] Schroeder's version of the revised H-I model still showed substantial depletions from pumping. Considering depletions alone, without accretions or adjustment for usable flow or offsetting the return flows from transmountain imports, Stateline depletions were 545,000 acre-feet for the 1950-85 period. This compares with the Kansas estimate of 612,000 acre-feet. Kan. Exh. 742. Both of these estimates used Kansas' figure for postcompact pumping.

XIV that the 1980 Operating Plan was not intended to, and should not, cancel out compact violations. The laches and mitigation arguments made during the consideration of my Draft Report are even more limited.

The Colorado estimate of Stateline depletions caused by postcompact pumping over the 1950-85 period, namely, 582,696 acre-feet, represents depletions of total flow, not of usable flow. However, there is sufficient evidence in the record to conclude that these depletions would still be substantial, even after reducing them to usable flow. Moreover, I have concluded in Section XV that the amount of pumping which Colorado has used to calculate Stateline depletions is low. Colorado excused almost two million acre-feet of pumping from precompact wells, which I have found to be erroneous.

The actual amount of depletions of Stateline flows from postcompact pumping still remains a major issue. If the Court finds there is liability, then additional evidence will be required during the remedy phase of the trial to refine the amount of depletions in accordance with this Report or the Court's directions. The amount of depletions is critical not only for damages, but also in fashioning a remedy for the future. Colorado now has a limited program in place to control pumping, but it has proved to be inadequate to prevent Stateline depletions. It remains to be seen whether modifications in this program can prevent future compact violations or more stringent controls will be required. It bears remembering that the Arkansas River Compact does not preclude pumping in Colorado, but only postcompact pumping (not offset by transmountain imports) that causes material depletions in the usable flow of the Arkansas River at the Stateline.

SECTION XXI

USABLE FLOW

The Arkansas River Compact provides that future development or construction shall not materially deplete Stateline flows "in usable quantity or availability for use to the water users in Colorado and Kansas." There is no definition of usable flow in the compact itself, and virtually no discussion of the concept in the record of compact negotiations.[126] The concept of usable flow first seems to have appeared in the 1943 decision in *Colorado v. Kansas*, 320 U.S. 383 at 396-97. Justice Roberts wrote on behalf of the Court:

> "The Kansas ditches are capable of diverting water only up to 2,000 c.f.s. When the flow is greater the excess cannot be diverted and used. It is admitted that the character of the flow of the river in Colorado is variable from year to year, from season to season, and from day to day, and the main river below Canon City may be almost without water one day, run a flood the next day, and, on the following day, be in practically its original condition. Thus it appears that both in Colorado and in Kansas there may at one time be flood water unavailable for direct diversion and, at another, not enough water to supply the capacity of diversion ditches. *The critical matter is the amount of divertible flow at*

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[126] There is some discussion in the record of the seventeenth and last meeting of the commissioners concerning this portion of Article IV-D, but the focus is on the term "materially" and offers no help on the meaning of usable flows. Jt. Exh. 3 at 17-32 to 17-37.

> *times when water is most needed for irrigation. Calculations of average annual flow, which include flood flows, are, therefore, not helpful in ascertaining the dependable supply of water usable for irrigation."* (Emphasis added.)

Shortly after this Supreme Court decision, C. L. Patterson, then chief engineer for the Colorado Water Conservation Board, offered his plan for the operation of John Martin Reservoir and the administration of water rights along the Arkansas River. This proposal was approved by the Colorado Attorney General and its chief engineer. Jt. Exh. 8 at 33. In that plan, Patterson recommended the following definition of usable flows:

> "Divertible Stateline flows are those at rates less than 2,000 cfs. in summer months (Apr.-Sep.) and less than 800 cfs. in winter months (Oct.-Mar.);
>
> "Usable Stateline flows are those portions of the divertible flows in volumes less than 30,000 A.F. in one summer month and 120,000 A.F. in one summer season, and in volumes less than 10,000 A.F. in one winter month and 40,000 A.F. in one winter season; and,
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> "All Stateline flows in excess of said rates and volume are considered undivertible and unusable in Kansas." Jt. Exh. 8 at 23-24.

During the course of the trial, Kansas experts applied this Patterson definition to the total depletions of Stateline flow. The result produced substantially higher quantities of usable flow than any of the approaches used and

recommended by the Kansas experts.[127] Kan. Exhs. 646, 648, 683.

A. The Durbin Approach.

Mr. Durbin began to analyze the usable flow issue by first plotting actual diversions in Kansas during the irrigation season against actual Stateline flows. Kan. Exh. 127. He did this for April through October of each year during 1951-85. Through this process, he developed a relationship between diversions and Stateline flows. RT Vol. 45 at 103. These data showed that river flows over 40,000 acre-feet per month were not diverted; moreover, they showed that the April-October diversions would not increase above approximately 30,000 acre-feet per month, regardless of the amount of river flow. *Id.* at 108. On average, Durbin concluded that about 78% of the Stateline flows during the summer were diverted. *Id.* at 109. Flows above 40,000 acre-feet per month during April-October, or above 140,000 acre-feet in total for the whole period, were considered by Durbin not to be usable. *Id.* at 113.

Durbin went through the same process for the winter months of November through March for the period 1951-85. Kan. Exh. 127B. On average, Durbin concluded that 24% of the winter flow was diverted, subject to a cap

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[127] For the April-October period, the Patterson formula indicates that 92% of the Stateline flows would have been used; Spronk's comparable estimate is 66%. For the November-March period, the respective estimates are 85% and 42%. RT Vol. 89 at 63.

of 7,500 acre-feet per month, and to a seasonal cap of 40,000 acre-feet. RT Vol. 45 at 111-12.

Finally, Durbin developed a relationship between Stateline flows and the amount of river flow percolating underground as groundwater recharge. Kan. Exh. 128. Durbin testified that between the Stateline and the Bear Creek Fault zone the river alluvium is very much like the valley fill alluvium upstream in Colorado, and is underlain and bordered by essentially nonwaterbearing rock. RT Vol. 45 at 96. In this reach of the river he said that groundwater recharge was minor, and recharge was not included in his calculations. *Id.* at 97. Downstream from the fault zone the river alluvium is underlain by the Ogallala formation. Between the fault and the Garden City gage, Durbin testified that part of the river flow percolates downward and laterally into the Ogallala formation. *Id.* at 97. For his groundwater analysis, Durbin used the period from 1925 to 1940. He calculated recharge during these years by taking the flows at the Syracuse gage, and subtracting downstream diversions and any flow past the Garden City gage. The balance, he said, went to groundwater recharge. *Id.* 115-17. On average, he concluded that 15% of the Stateline flows were used for groundwater recharge. *Id.* at 116.

B. The Larson Modifications.

As part of Kansas' replacement case, Larson reviewed the Durbin exhibits on usable flow. He prepared certain revised exhibits, following Durbin's concept but with some minor corrections in data. He also

eliminated certain high flow months from the calculations, and lengthened the historic period of record used to determine groundwater recharge. Kan. Exhs. 127**, 127A**, 127B**, 128**; RT Vol. 99 at 127-29, 133-36.

As a result, Larson modified Durbin's coefficients, using 72% for the summer irrigation months and 25% for the winter months. RT Vol. 100 at 11. Larson pointed out that Kansas farmers sometimes diverted all of the winter flows available and at other times no winter flows were diverted. On average, however, 25% of Stateline flows were diverted for use during the winter months. RT Vol. 99 at 136. Larson also reduced the percentage of Stateline flows going to groundwater recharge from 15% to 9.9%. RT Vol. 100 at 11.

In calculating groundwater recharge, Larson used the period of 1925 to 1948, excluding the flood year of 1942. RT Vol. 99 at 137. He used the same methodology as Durbin, namely, taking the annual flow at the Syracuse gage, and then subtracting the annual flow at the Garden City gage as well as the diversions from the various Kansas ditches between them. *Id.* at 138. The balance constituted average net groundwater recharge. *Id.* Larson testified that he selected these early years before the compact was signed so that any change in recharge that might have occurred after the compact would not be part of the analysis. *Id.* at 140.

Later in this section, the method devised by Spronk for determining usable flow is described. Larson thought that the Spronk methodology was better than the Durbin approach because it applies a usable flow factor for each

month, based on a daily analysis, as opposed to a long-term average value. *Id.* at 142.

C. The Helton Approach.

Colorado's evidence on usable flow was presented through Helton. In his analysis, he examined the Stateline flows, the diversions by the Kansas ditches, gains and losses in the river in Kansas between the Stateline and Garden City, and the flows passing Garden City on a monthly basis. RT Vol. 86 at 41-43; Colo. Exh. 238*. Using Colorado's analysis of depletions, he determined depletions of Stateline flows that would have affected unused Stateline flows during each month. RT Vol. 86 at 82. His analysis required streamflow records for the Garden City streamflow gage, and since no daily streamflow records were published after 1969, he had no opinion on usable flows for the 1970-85 period. RT Vol. 117 at 101-02, 106. Obviously, this is a severe limitation upon the usefulness of the Colorado evidence.

Helton's approach covered the years from 1950 through 1969, and actually applied to only 169,974 acre-feet of depletions out of the total depletions of 582,694 acre-feet calculated by Colorado. RT Vol. 117 at 103. That is, his analysis did not cover 412,700 acre-feet of depletions, as determined by Colorado, which were caused by pumping after 1969. *Id.* Moreover, Helton concluded that depletions of Stateline flows during the winter were not depletions of usable flow. RT Vol. 117 at 103-04. In essence, he did not consider any winter flows to be usable, and on that basis removed still another 85,536 acre-feet from his calculations. *Id.* at 103-05.

I find that it was incorrect to regard all winter flows as unusable. There is no evidence that the compact negotiators intended such a result. Indeed, Patterson, one of the Colorado commissioners, in the plan he proposed earlier in the ongoing river negotiations, defined usable flow to include winter flows. Jt. Exh. 8 at 23-24. The record shows actual wintertime diversions in Kansas, and these diversions were plotted by the Kansas experts in reaching their wintertime coefficients. Kan. Exh. 684. Winter flows also contribute to usable groundwater recharge.

Helton's methodology included the computation of gains, that is, increases in the flow of the river within Kansas. Colo. Exh. 238*, columns 8, 13, 14. The evidence is not altogether clear on the sources of such gains. Apparently they would include groundwater outflow, return flows, and surface runoff within Kansas. RT Vol. 86 at 48, 50, 63. Helton testified that such gains did not include return flows from deep wells pumping from the Ogallala Aquifer, although that issue was not explored in detail. RT Vol. 86 at 51. Of course, there were also shallow wells in Kansas which pumped from the river alluvium, and presumably some groundwater from these wells would reach the river.

The importance of Helton's calculations of river gains in Kansas is that he allocated all surface diversions first to such gains. RT Vol. 117 at 87. That is, his calculations assume, to the extent of any gains, that Kansas farmers diverted local sources of water rather than taking an equivalent amount of Stateline flows. Whether as a result of his gains analysis or not, Helton concluded that large amounts of Stateline flows were not used, at least in the

early postcompact years. Colo. Exh. 238*, column 23. Presumably, in his view, these were flows available for use in Colorado. Asked about his reasons for integrating the concept of gains into his approach, Helton testified, "Well, I think Kansas should be required to use water that is available in Kansas prior to the time that it either makes demands out of conservation storage in John Martin Reservoir or claims a credit for a diversion [by Colorado] of state line flow." RT Vol. 117 at 88.

I find nothing in the record of compact negotiations, or in the compact itself, to support this view. The essence of the compact, apart from the provisions relating to John Martin Reservoir, was to protect the status quo with respect to the division of Arkansas River water between the states. There was no intent that Kansas should be required to make use of other Kansas water supplies before being allowed to complain of uses in Colorado that would materially deplete Kansas' usable share of Stateline supplies.

Helton also included transit losses, that is, seepage going to groundwater recharge, as part of the Stateline flows not diverted. RT Vol. 86 at 52-53, 62. I also find this to be incorrect. The definition of usable flows should include water for groundwater recharge. Kansas made this point in the last meeting of the compact negotiators, without objection from Colorado. Commissioner Knapp stated that uses in Kansas included "not only the actual ditch diversions which are available for measurement, but the water which has gone into ground storage through the years to recharge the pumping area." Jt. Exh. 4 at 17-34. He estimated the amount of water used for

groundwater recharge to be about 25,000 acre-feet annually. *Id.*

Helton did not agree with the methodology used by the Kansas experts in determining usable flows, although he acknowledged that Larson's mathematical calculations were correct. RT Vol. 115 at 15, 27; RT Vol. 134 at 29. Helton testified that if the Durbin methodology were to be used, then different coefficients would be more appropriate. RT Vol. 115 at 19, 26; Colo. Exh. 983. His coefficients, which were generally lower than Larson's, were derived from an analysis of Kansas diversions during 1950-69. RT Vol. 115 at 16. These coefficients included the concept of allocating certain diversions to river gains within Kansas. *Id.* Helton's coefficient for groundwater recharge was 6.6 percent, as opposed to 9.9 percent used by Larson.

For his calculations, Larson used the precompact period of 1925-48, excluding the flood year of 1942. Helton's calculations, on the other hand, were based upon the early postcompact period of 1950-69. RT Vol. 115 at 18. Helton testified that this later period was more appropriate because it represented operations under the compact, and a period before wells in Kansas had begun to deplete river flows in large amounts. RT Vol. 115 at 18; RT Vol. 117 at 92-93. He objected to the period used by Larson because it did not represent fully "the operation of John Martin Reservoir and the Arkansas River Compact." RT Vol. 115 at 18. However, the Larson approach more closely matches the amount of flow used for groundwater recharge under precompact conditions. I have concluded that the compact was intended, in part, to reflect generally the division of waters between the

states and the uses that had been occurring. Moreover, the period of time selected by Larson does not reflect any increase in recharge that may have been brought about by well development in Kansas.

D. The Spronk Approach.

As part of Kansas' replacement case, Spronk Water Engineers developed a new method to quantify depletions of usable Stateline flows. This procedure depended, in part, upon the reconstruction of daily flow measurements at the Garden City gage. The USGS gage at Garden City was maintained only as a peak flow gage from 1970 to 1985. However, it was learned in the spring of 1991, well after the trial had begun, that although daily streamflow records had not been published, continuous recorder charts were in place during the 1970-85 period. These charts reflected water levels at the gage, that is, "stage heights," from which river flows could then be computed.

Colorado objected strongly to the accuracy of the reconstructed flow records, and this became a subject of considerable testimony. To translate the readings from the water level gage into flow measurements of cubic feet per second, a rating curve is used. Here, the Arkansas River channel is sandy and about 100 feet wide. If the channel changes significantly, a new rating curve must be developed, and in any event, the curve must be checked from time to time against actual flow measurements. In addition to the water level data from the continuous recorder, the USGS made 26 actual measurements of flow during the 1970-86 period, together with some 70 observations of

"no flow" and 55 observations of flow but without measurements being made. RT Vol. 108 at 52-53. The argument turned on whether sufficient measurements were taken, and whether the seven different rating curves developed and used during this period were adequate to reconstruct daily flows as used in the Spronk analysis.

Spronk's object was to determine for each day whether all of the Stateline flow was being used. If not, then additional flow at the Stateline on that day was considered to be unusable. As part of that analysis, he assumed that if the outflow at the Garden City gage were less than 5 cfs, then Kansas was fully using the Stateline flow.[128] Spronk's analysis, therefore, did not require refined accuracy. Moreover, Colorado's expert witness acknowledged that the data relied upon by Spronk might be adequate to identify high flows, moderate flows, low flows and no flows. RT Vol. 109 at 19. I believe that the reconstructed gage measurements were probably sufficient for the purpose for which they were used. However, there are more serious concerns with the Spronk approach.

In determining whether Stateline flows were being fully used in Kansas, Spronk applied a number of other factors besides the flow, or lack of it, at the Garden City gage. RT Vol. 89 at 40-43. Overall, the object was to determine the percentage of days in each month when flows were being fully used in Kansas. Those percentages

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[128] Between 1970 and 1973, Spronk used 20 cfs in order to recognize discharges of nonriver water from the Garden City power plant that were introduced into the river just upstream from the Garden City gage.

were then applied to the monthly outputs of changed Stateline flow calculated by the revised H-I model. RT Vol. 89 at 60; RT Vol. 100 at 12-14. For example, in May of 1955, Spronk determined that more flow could have been used in sixteen days of the month, or a ratio of 16/31. That is a percentage of 51.6, which Spronk applied to the depletions calculated for May, 1955, namely 1,043 acre-feet. The result became 538 acre-feet of depletions of usable flow for that month. RT Vol. 89 at 59-61; Kan. Exh. 565***.

Kansas argues that applying long-term averages, as Durbin did, underestimates the depletions of usable flow during the late 1970s and early 1980s. That was a period of drought, and according to Kansas most of the low flows were usable. The Spronk analysis was said to correct this inequity.[129] Kansas states that the Spronk methodology gives substantially the same results as the Durbin analysis, except from approximately 1975 to 1982 when the Spronk analysis more properly represents actual hydrologic conditions. Kan. Opening Br. at 107; RT Vol. 142 at 15-16. However, as Colorado points out, virtually the entire H-I model is based on average data. RT Vol. 142 at 46. Durbin testified to the appropriateness of using averages to represent hydrologic data. RT Vol. 51 at 78. Overall, there is no question about the fact that the

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[129] As the United States notes, the fact that virtually all flows during a dry period may be usable does not "carry this argument." RT Vol. 142 at 48. The more fundamental question is what the Stateline flows and depletions were before usability criteria were applied.

Spronk approach produces the greatest amount of depletions of usable flow. For example, using Spronk's calculations of usable flow, the revised H-I model yields total depletions from both pumping and the WWSP of 489,000 acre-feet for 1950-85. Using the Durbin analysis, with the Larson coefficients, this total drops to 365,000 acre-feet. Colo. Exh. 975, Comparison 1.

Colorado acknowledges that in theory, at least, there is some validity to the daily approach used by Spronk. Colo. Closing Well Br. at 237. However, the Colorado experts testified that the Spronk usable flow method was not appropriate for use with the revised H-I model. The Spronk analysis assumes that the H-I model can accurately predict changes of Stateline flow on a monthly basis. RT Vol. 110 at 126-27; RT Vol. 111 at 32, 38-39, 128-29; RT Vol. 115 at 23-24. I believe the objection is sound.

There was a great deal of testimony by both Colorado and United States experts on this issue, and they generally agreed that the H-I model results were not reliable on a monthly basis. See, e.g., U.S. Exh. 26*, 29; RT Vol. 118 at 92 *et seq.*; RT Vol. 114 at 107-111; RT Vol. 133 at 21.[130]

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[130] Although the H-I model was improved by Kansas' replacement experts, the fundamental structure of the model was not changed. Durbin's testimony shows that the model was originally designed to predict changes in Stateline flows. In his opinion, the model was a "good predictor" when "looking at long periods of time." RT Vol. 51 at 72. Using "a long-term average," he testified that the model predicted actual Stateline flows with a "fair degree of accuracy." *Id.* at 84. If multi-year periods were averaged, Durbin said "there would begin to be more and more correspondence between the model and what was actually observed." RT Vol. 44 at 86.

Helton pointed out that the mean absolute deviation[131] at the Stateline, excluding the high flows of 1965, was about 4,200 acre-feet per month compared to an average monthly flow of 10,500 acre-feet. On a monthly basis, he testified that the revised H-I model "did not predict closer than 40 percent." RT Vol. 114 at 111. For the 1976-85 period, the maximum monthly overprediction was 21,018 acre-feet, and the largest underprediction was 19,755 acre-feet. U.S. Exh. 29. Using a standard deviation of error analysis, one of the United States experts testified that 32% of the time the monthly error was greater than 6,000 acre-feet. RT Vol. 118 at 98.

Colorado's experts also criticized the Spronk usable flow analysis because it did not factor out increased losses in the Arkansas River in Kansas due to increased well development in Kansas in the 1970s. RT Vol. 111 at 129, 132-36; RT Vol. 112 at 8-41, 56. To the extent that well development in Kansas may have increased the amount of streamflow going to groundwater recharge, the point is valid. Article IV-D of the compact covers future developments in Kansas, as well as in Colorado. Larson testified that during the precompact years approximately 10 percent of the Stateline flows went to groundwater recharge. If surface flows available for diversion were reduced

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[131] This concept is intended to give a true indication of the difference between observed and predicted values. It eliminates a close correlation based only on simple averages where equal amounts of underpredictions and overpredictions offset one another. Under the "mean absolute deviation" concept, underpredictions (minus values) are treated like overpredictions (positive values), and they are all totaled and averaged. RT Vol. 114 at 108; RT Vol. 118 at 96.

because postcompact wells in Kansas caused streambed percolation to increase, Colorado should not be held responsible.

E. Conclusions.

I conclude that the Durbin approach, using Larson's coefficients, is the best of the several methods presented for determining usable flow. Moreover, I believe this is a reasonable way in which to determine depletions of usable flow.

SECTION XXII

WINTER WATER STORAGE PROGRAM

Most of the final period of the trial, in which the United States played a major role, was devoted to the Winter Water Storage Program ("WWSP"). Kansas' pleadings on this issue focused on its claim that a resolution adopted by the Arkansas River Compact Administration on July 24, 1951 required that any reregulation of the native waters of the Arkansas River be approved by the compact administration. Complaint at 4, ¶ 12; First Amended Complaint at 3-4, ¶ 12. Before trial, however, Colorado filed a motion for partial summary judgment requesting a determination that the compact administration's approval of the WWSP was not legally required. I recommended that Colorado's motion be granted, reserving for trial, however, the issue of whether Stateline flows had actually been materially depleted by the WWSP in violation of the compact. See Part II of this Report. The trial proceeded, therefore, on that reserved factual issue.

A. History of the Winter Water Storage Program.

1. Pueblo Reservoir.

Pueblo Reservoir first appeared as a potential feature of the Fryingpan-Arkansas Project in a 1948 interim report issued by the United States Bureau of Reclamation. Among other project purposes, the report proposed the storage and reregulation in Pueblo Reservoir of the native flows of the Arkansas River, subject to agreements among existing water users. RT Vol. 11 at 126, 128-136; Colo. Exh. 643 at 12. Congress authorized the Fryingpan-Arkansas

Project in 1962. Jt. Exh. 168. Besides the importation of water from the Colorado River watershed west of the Rockies, project purposes included the reregulation of "winter flows of the Arkansas River that are presently diverted for direct-flow use but which, by agreement, could be converted to more beneficial summer use through storage in the Pueblo Reservoir." Jt. Exh. 166 at 32.

In 1964, the Bureau of Reclamation advised the Southeastern Colorado Water Conservancy District[132] that it should begin to develop a program for the storage of winter native flows of the Arkansas River in Pueblo Reservoir. Colo. Exh. 532 at Tab-6 at 6-7. The first winter water storage plan was finalized in 1975 on a three-month trial basis by agreement among the Southeastern Conservancy District and Colorado water users in the Arkansas Valley. RT Vol. 85 at 36, 40-41, 51.

Pueblo Reservoir is owned and operated by the United States, through the Bureau of Reclamation, although other federal and state agencies, including the

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[132] The Southeastern Colorado Water Conservancy District was formed in 1958 under Colorado law, among other reasons, to create an organization with powers acceptable to the Secretary of the Interior to enter into a repayment contract with the United States for the Fryingpan-Arkansas Project. Jt. Exh. 104 at 5; RT Vol. 85 at 13, 15-16. The Southeastern Conservancy District signed a repayment contract in 1965 which provided for winter storage in project reservoirs, and included penalties in the form of increased payments for project water if a winter water storage program were not implemented. Colo. Exh. 532, T-3 at 4, ¶¶ 1(e), 6(c), 11(a).

Corps of Engineers, assist with the operation of the reservoir. The WWSP is administered by the Colorado state engineer, based on operating criteria agreed upon by the participating entities. The United States acknowledges that if Kansas is correct that the winter storage program has caused a material decline in Stateline flows, then "the Program should be adjusted, notwithstanding its benefits to Colorado." U.S. WWSP Br. at 2. Federal legislation authorizing the project provides that Colorado's obligations under the Arkansas River Compact shall not be "altered by any operations of the Fryingpan-Arkansas project." Colo. Exh. 545; Jt. Exh. 168.

2. The WWSP.

Winter flows of the Arkansas River have long been used by Arkansas Valley farmers to compensate for the shortage of irrigation water during the summer. A number of canal companies in Colorado have private reservoirs and appropriate storage rights to store such off-season flows for later use during the summer irrigation season. In addition, farmers in Colorado and western Kansas have diverted water for winter irrigation, that is, diversion of water onto bare fields during the nongrowing season. This practice allowed farmers to take advantage of what otherwise would have been unusable water by increasing the soil moisture for later use by crops during the growing season. However, winter irrigation is affected by weather, and is subject to relatively high rates of evaporation from the wet soil. The Colorado Supreme Court has stated:

> "Winter irrigation is a difficult, less efficient method of irrigation. If possible, a much preferable operation is to store the direct flow winter water and use it later in the year." *Purgatoire River Water Conservancy Dist. v. Kuiper*, 593 P.2d 333, 335 (Colo. 1979).

Winter irrigation below John Martin Reservoir in Colorado generally ended with construction of that reservoir and adoption of the Arkansas River Compact. Under the compact, all winter flows entering the reservoir are stored, subject to the release of river flow not to exceed 100 cfs upon demand by Colorado. Article V-A.

As the Winter Water Storage Program has currently evolved, it operates during a four-month period beginning November 15 and ending March 15 of the following year. Jt. Exh. 22 at 17. The program commenced in 1976, but did not operate during 1977-78. Present participants in the WWSP include all of the major ditch and reservoir companies that have historically diverted from the Arkansas River between Pueblo Reservoir and John Martin Reservoir, except the Otero Ditch Company and the Rocky Ford Canal Company.[133] Jt. Exh. 22 at 22. These participating companies store water during the winter months in Pueblo Reservoir, in John Martin Reservoir,

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[133] The participants are the Amity Mutual Irrigation Company, The Bessemer Irrigating Ditch Company, the Catlin Canal Company, The Colorado Canal Company, The Fort Lyon Canal Company, The High Line Canal Company, The Holbrook Mutual Irrigating Company, The Lake Henry Reservoir Company, The Lake Meredith Reservoir Company, the Las Animas Consolidated Canal Company, The Oxford Farmers Ditch Company, the Riverside Dairy Ditch, and the West Pueblo Ditch.

and in various off-channel reservoirs, and it is then released for use later in the year. RT Vol. 82 at 152. Arkansas River flows during the winter months are relatively small, and almost the entire winter flow of the river above John Martin Reservoir is now diverted and stored in reservoirs. RT Vol. 83 at 76-78. Winter irrigation has essentially been supplanted. Total storage under the program has varied from 94,793 acre-feet in 1978-79 to 216,886 acre-feet in 1986-87. Colo. Exh. 210. There are no limits on the amounts of winter water that can be stored except for the capacities of the reservoirs.

The WWSP, which went through a series of annual changes, was finally approved by a decree of the Colorado Water Court in 1987. RT Vol. 85 at 40, 56-57; Jt. Exh. 22. The decree basically confirms the operating plan that had been in effect since 1983. RT Vol. 86 at 9. Under the plan, the first 100,000 acre-feet of water stored during the winter is allocated among the WWSP participants according to percentages, with 71.2% of the water being allocated to those holding off-channel storage rights, and 28.8% to those participants owning direct-flow rights only. Jt. Exh. 22 at 18-19. The next 2,750 acre-feet of winter stored water above 100,000 acre-feet is allocated to the Amity Mutual Irrigation Company, which may store it in the Great Plains Reservoirs or John Martin Reservoir. The next 356 acre-feet is allocated to the Holbrook Mutual Irrigating Company. Amounts of winter-stored water above 103,106 acre-feet are allocated among the WWSP participants according to a second set of percentages. Jt. Exh. 22 at 19-20. In part, the allocation formulas reflect long-term average diversions by the participants, but in

part they are the result of negotiations among the various companies. RT Vol. 85 at 39-40, 93-96, 121-22.

3. Development and Implementation of the WWSP.

Colorado urges that Kansas, with full knowledge, acquiesced in the development and implementation of the WWSP, and therefore should not now be heard to complain. Colo. Closing WWSP Br. at 64-65. Acquiescence was not specifically raised by Colorado as a defense in its answer, although other equitable defenses were pled. In a case of this kind, however, the issue should not be foreclosed by an overly narrow view of the pleadings.

There is no doubt that Kansas was kept well informed about the development of the WWSP. In 1969, the Southeastern Conservancy District formed a Winter Storage Committee which included representatives of all entities eligible to participate. Chairman of the Board of Trustees of this committee was Charles L. ("Tommy") Thomson. RT Vol. 85 at 30-31. Thomson began to inform Kansas of developments at least as early as 1970 when he reported to the Arkansas River Compact Administration at its annual meeting. RT Vol. 85 at 36-37. He testified that thereafter "It more or less became an annual exercise that I would go down and tell them how we were getting along." *Id.* at 37.

In December of 1975 Thomson reported to a meeting of the compact administration that the program was being inaugurated on a three-month "experimental

basis." Colo. Exh. 532, Tab 13. The compact administration was complimentary, and established a special engineering committee "to report to the Administration at each annual meeting the opinion of that committee of the relationship between Fryingpan-Arkansas Project and the Arkansas River Compact Administration." Colo. Exh. 532, Tab 13. Guy E. Gibson, one of the Kansas members of the compact administration and the Kansas Chief Engineer, Division of Water Resources, was appointed to that committee. RT Vol. 85 at 60. Gibson was also placed on the mailing list for the minutes and other documents from the Southeastern Conservancy District's Winter Storage Committee. Colo. Exh. 532, Tab 11, Tab 25, Tab 26. In short, there is ample evidence that the Kansas representatives "were fully aware of the program and how it had been put together and how it was to be operated, but it was understood by everybody that it was an experimental program and the results were to be evaluated." RT Vol. 85 at 67 (Thomson).

Before approval by the Colorado Water Court in 1987, the WWSP operated on a voluntary basis that required unanimous agreement. Operating plans for the WWSP changed from year to year from 1975 to 1983 when the current formula for allocating water among the participants was adopted. Colo. Closing WWSP Br. at 63. While the program was still being implemented on an interim or trial basis, Kansas expressed concern at the December, 1980 meeting of the compact administration over potential reduction of inflow into John Martin Reservoir resulting from the program. Colo. Exhs. 538, 545. Kansas suggested that a study be made, which was in fact

undertaken by the USGS and completed in February, 1981.

The USGS performed a double-mass curve analysis of streamflow records for 1967-79. The survey found that the data did not indicate that inflow to John Martin Reservoir had been reduced as a result of the storage of winter water in Pueblo Reservoir. Colo. Exh. 538. These results coincided with a computer model analysis made by the USGS in 1975. Using a study period from only 1972 to 1974, and certain assumptions about the nature of the program, the computer analysis predicted an average annual increase of 7,300 acre-feet across the Stateline. Jt. Exh. 88 at 4.24-26. Also in 1981 the Kansas Division of Water Resources reviewed the data and concluded that comparative flows did not show a "reduced flow at the Las Animas gage . . . since operation of Pueblo Reservoir began." Colo. Exh. 539.

Thus, the early and preliminary reviews of winter water storage did not indicate any adverse impact upon Kansas, and there is nothing in the record to suggest any contrary intent. Under the circumstances, I am not persuaded that Kansas should be deemed to have acquiesced in violations of the Arkansas River Compact resulting from the storage of winter water, if indeed material Stateline depletions should prove to be a consequence of that program.

Colorado also argues that Kansas benefited from the storage of winter water in John Martin Reservoir, especially after the 1980 Operating Plan became effective. Having accepted benefits from the WWSP, Kansas should not be permitted, urges Colorado, to claim injury from

the program. Colo. Closing WWSP Br. at pp. 64-66. Storage in John Martin Reservoir was not the major thrust of the WWSP. However, as I concluded in Section XIV, the 1980 Operating Plan provided benefits to both Colorado and Kansas. Consideration was given and received by both states. Kansas did not trade depletions of Stateline flow which are in violation of the Arkansas River Compact in return for benefits under the 1980 Operating Plan.

Kansas also adds that an agreement between the states, without the consent of Congress, cannot alter their respective rights and duties under the compact. *Texas v. New Mexico*, 462 U.S. 554, 564, 567-68 (1983). See also Kan. Exh. 751 (United States Brief in *Oklahoma and Texas v. New Mexico*). However, Colorado responds that the compact has not been unlawfully modified, that adoption of the 1980 plan was well within the powers of the Arkansas River Compact Administration. Be that as it may, the issue of whether the 1980 Operating Plan alters the compact without the required consent of Congress is not before the Court in this case. The fact is that the 1980 plan is in effect with the consent of both states. The issue now raised is whether Kansas' conduct in relation to the plan should invoke equitable defenses. For the reasons given here and in Section XIV, I have concluded that Kansas should not be barred by equitable considerations from pursuing its claim against the WWSP.

B. Results of the Computer Models.

Both Kansas and Colorado modeled the impact of the Winter Water Storage Program. The United States, on the other hand, reviewed the revised H-I model in depth and

developed the capability to operate it, but did not construct a model of its own.

The depletions to usable flow predicted by the original version of the H-I model are summarized in Kansas Exhibit 112* (12-6-90). For the WWSP, this exhibit shows depletions of 255,000 acre-feet. Comparison H; RT Vol. 88 at 131. In this comparison, it should be noted that Durbin left the switch "on" for the 1980 Operating Plan. The replacement experts, however, took a contrary view and turned that switch "off" in order to isolate the WWSP impacts. RT Vol. 88 at 133-35. The depletion figure of 255,000 acre-feet is the result, in part at least, of the serious coding error found by Colorado in the H-I model. In evaluating the overall persuasiveness of the Kansas case, this original evidence cannot be forgotten or ignored.

Kansas' replacement experts corrected the coding error, made other changes to the model, and then lodged Kansas Exhibit 111**. This exhibit showed the WWSP impacts on usable flow at 44,000 acre-feet. RT Vol. 88 at 132-33. But even that amount turned out to be incorrect. As part of his direct examination, Spronk testified that the input file used in the revised model for the amount of decreed storage available in the Great Plains Reservoirs should have been 223,221 acre-feet instead of 166,892 acre-feet. RT Vol. 88 at 141-42. As a result of this additional change, the depletion figure of 44,000 acre-feet calculated by the revised H-I model dropped to 40,000. Kansas then prepared Exhibit 111*** to reflect the corrected figures. Colorado was plainly frustrated over this latest revision, and complained of the prejudice resulting from abruptly finding out that "everything we

did has to be redone." RT Vol. 88 at 143. My disappointment was also evident, although it appeared that Kansas was attempting to get it right. *Id.*

Kansas' final WWSP evidence, presented through its replacement experts, showed total depletions of 53,000 acre-feet, and 40,000 acre-feet of depletions to usable flow. Kan. Exh. 111***.[134] These calculations, however, did not account for return flows from transmountain imports. If these are considered, Spronk testified that depletions to usable flow amount to only 5,000 acre-feet for the entire period of program operation (1976-85). Kan. Exh. 651. Kansas, however, objects to such an offset, arguing that Colorado offset those return flows against pumping, and that no party has suggested that the benefits of imported water be used to reduce WWSP depletions alone. Kan. Comments on Draft Report at 9, 15, 45. In any event, the parties appear to agree that care must be taken not to "double-count" the offset effect of transmountain return flows.

Colorado also presented evidence regarding the WWSP. Helton testified that there was "no discernible impact" on Stateline flows from the WWSP. RT Vol. 115 at 59-60; RT Vol. 86 at 88. Besides the results of Colorado's computer study, he relied on his own work with irrigators and his "observation of what the operations actually were during the winter storage program."[135] RT Vol. 115 at 60.

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[134] This usable flow figure is derived from the Spronk analysis. If Durbin's methodology with Larson's coefficients are used, the result is 27,000 acre-feet. Colo. Exh. 975, Comparison 3.

[135] Helton was one of Colorado's two representatives on the special engineering committee formed by the compact

Colorado used its water budget to analyze the effects of the WWSP under a study called a "What-if 1" comparison. Colo. Exh. 134* at 8.1. However, unlike Kansas, Colorado did not analyze the WWSP for the years when it was actually operating. Instead, Colorado superimposed the program on the historic period of 1950-75 and 1978, that is, during the years when the program was *not* in place. Colorado did not think it was possible to predict reliably what the winter diversions would have been after 1976 under an assumption that the program was not in operation. Even so, Kansas says that the Colorado analysis is "simply for the wrong period."[136] Kan. Opening Br. at 97.

I cannot say that it was legally wrong for Colorado to simulate the operation of the WWSP over an historic period.[137] However, I believe it is more appropriate to

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administration in 1975 to review and analyze the program, and to report back to the administration. Colo. Exh. 532, Tab 13.

[136] Kansas was also critical of a number of incorrect assumptions in Colorado's analysis which had the effect of overstating evaporation or consumptive use under historic winter irrigation practices, and thus understating the impact of the WWSP. See, e.g., failure to cut off winter soil evaporation at temperatures below freezing, RT Vol. 103 at 59; assuming that winter irrigation water was applied to all of the lands of the WWSP participants, RT Vol. 114 at 149; and underestimating tailwater returns during the winter months, e.g., winter return flows from the Fort Lyon Canal were calculated to be zero for all years from 1950 through 1984. Kan. Exh. 735, RT Vol. 134 at 110-11. Moreover, the Colorado analysis assumes there were no depletions above the Las Animas gage. RT Vol. 116 at 131-32.

[137] This was in fact the technique used by the Bureau of Reclamation in evaluating the potential impact of the Trinidad Project. Studies were done in 1961-64 using the period of

evaluate the actual operations of the WWSP. There is a continuing obligation to implement the program in accord with the Arkansas River Compact, and in the future it will become increasingly important to determine compliance on a current basis. To conclude that the program would not have caused Stateline depletions if it had been operated under 1950-75 conditions does not necessarily establish that future operations, under perhaps quite different hydrologic and cultural conditions, will not cause depletions.

However, the Colorado water budget analysis does show some limited depletions, in excess of 9,000 acre-feet for the 27 year period studied, or about 354 acre-feet per year on average. Calculated from Colo. Exh. 134* at 8.1, Col. 16; RT Vol. 134 at 113. Apparently the 9,000 acre-feet figure would represent depletions of total flow as opposed to usable flow, although I found no specific evidence on this point.[138]

C. Position of the United States.

Initially, the United States questions whether Kansas' expert testimony based upon the revised H-I model satisfies threshold standards of reliability, citing the Supreme Court's recent decision in *Daubert, et al. v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. ___, 125 L.Ed.2d 469 (1993).

1925-57 to simulate operation of the proposed reservoir. Jt. Exh. 24a, 24b. Of course, these were preproject studies. There was no opportunity in 1961-64 to analyze actual operations.

[138] Kansas understood that this figure related to total, not to usable flows. RT Vol. 142 at 56.

I note that the decision is limited to the "scientific" portion of Rule 702 although the rule also applies to "technical, or other specialized knowledge." Moreover, the discussion is seemingly aimed at jury cases. Nonetheless, if the decision, including the "general observations" of the Court, does apply to all of the expert testimony in this case, I believe that *admissibility* requirements have been met. The real issue here, however, is whether Kansas' expert testimony, based as it is largely upon the results of the revised H-I model, is sufficiently persuasive to carry the burden of proof with respect to the WWSP. For reasons later discussed, I do not believe that it is.

The United States intervened in the case well after preparations for trial by the two states had begun. At the outset, the United States did not have access to the new data being developed by experts for the states, e.g., amounts of pumping, diversions, irrigated acreage, storage data, and consumptive use by phreatophytes. RT Vol. 119 at 115. The United States' experts attempted to make a water balance of the surface and groundwater system of the Arkansas River in Colorado. However, because of the lack of data they could not determine from that analysis whether the WWSP had an impact on Stateline flows, "either positive or negative." RT Vol. 119 at 113. Nor did they believe, with the current data then available, that they could develop their own model. *Id.* at 120. Instead, the United States' experts concentrated their attention on

Kansas' revised H-I model.[139] No similar effort was made to analyze the Colorado water budget.

The two principal experts for the United States both testified that they did not know whether the WWSP had any impact on Stateline flows, "plus or minus." RT Vol. 120 at 78. Moreover, given the relatively small magnitude of the claimed impacts of the WWSP, and the present state of knowledge, Mr. Finlayson did not believe that a model could be constructed "to determine that impact with a reasonable degree of accuracy." RT Vol. 120 at 74. The basic problem, he testified, lies in attempting to take a single change in the use of a relatively small amount of water, and to route that change from Pueblo to the Stateline. RT Vol. 120 at 23.

However, the Deputy Assistant Commissioner, Resources Management, of the Bureau of Reclamation expressed a different view.[140] Concerning the WWSP, he testified that the Bureau recognizes an obligation not to cause a material depletion in Stateline flows, and that in his opinion the Bureau has been meeting that obligation. RT Vol. 122 at 52. On questioning from me, however, it

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[139] These expert witnesses were Donald J. Finlayson and Charles W. Binder. Mr. Finlayson served with California Department of Water Resources for some 30 years, retiring as Chief of its Planning Branch. His experience and qualifications are set forth in U.S. Exhibit 47*. Mr. Binder holds a 1981 master's degree in civil engineering from Colorado State University. He has worked for Simons, Li & Associates and Spronk Water Engineers. Since 1989 he has been employed by David Keith Todd in Berkeley, California. His qualifications appear in U.S. Exhibit 46.

[140] Raymond H. Willms, located in Denver, Colo.

became apparent that he was essentially relying on assurances from Colorado. "They have indicated to us that they operate it [WWSP] without impairing or causing a material depletion of the compact." RT Vol. 122 at 53. While the Bureau had not seen any indication of impairment, Willms acknowledged that the Bureau itself had not made any independent studies and was going ahead with its part of the program on the assumption that it was being properly administered by Colorado. RT Vol. 122 at 53. It should be noted that the federal facilities are only part of the WWSP; that Willms testified that there cannot be "two masters" here; and that the Bureau generally leaves the administration of water rights to the states. RT Vol. 122 at 19-20.

As part of the post-trial briefing process, I inquired of counsel concerning the United States' position on WWSP compliance with the compact – that is, whether the program is indeed in compliance or the United States does not know. Counsel for the United States replied, "Under our interpretation, the WWSP is in compliance with the Compact, which specifically provides for new beneficial development such as the WWSP." Aug. 24, 1993 letter at 3. Noting that such new development is obligated not to cause material depletions, counsel nonetheless went on to state that the compact "does not require affirmative proof of 'no depletion' before development can go forward." *Id.* Rather, the United States concluded, "beneficial developments with no known or obvious adverse impacts seem to be permitted under the Compact unless shown to have caused disallowed depletions." *Id.* (It should be recalled

that the United States would also require Kansas to establish any compact violation by "clear and convincing" evidence.)

I am not persuaded that the United States should have so little responsibility. Pueblo Reservoir is a major storage facility, and to alter the regime of the Arkansas River by storing winter flows is not a trivial change. The compact is a law of the United States, binding on the Bureau of Reclamation as well as on the States of Kansas and Colorado. *Texas v. New Mexico*, 462 U.S. 554, 564, 77 L.Ed.2d 1, 103 S.Ct. 2558 (1983). In a development of this kind, the United States should not operate the project or participate in its operation, without a good faith belief, based on whatever data or studies may be needed, that the United States is acting in full compliance with the law. This is not to suggest that United States' officials have not been acting in good faith. But their beliefs appear to rest primarily on assurances from Colorado, without independent review or confirmation.

D. United States Critique of the Results of the Revised H-I Model [WWSP].

The central thrust of the United States' case is that the revised H-I model is not sufficiently reliable or refined to prove Stateline depletions from the WWSP. According to Kansas' own evidence total depletions to usable flow over a nine-year period of operations (1976-85, except for 1978) amount to 40,000 acre-feet. If the Court accepts my recommendation on the methodology to be used for the calculation of usable flows, then the 40,000 acre-feet amount is reduced to 27,200 acre-feet.

Colo. Exh. 975. If accretions are considered, the depletions are eliminated entirely. *Id.* The essence of the United States' position is that the ranges of error or uncertainty in the H-I model results, whether considered on an annual or monthly basis, are far greater than the depletions sought to be calculated. A shortage derived from the model results may well reflect only model error, not the real impact of the WWSP. As one Colorado expert put it, "the error is simply a lot bigger than the effect we are trying to find." RT Vol. 133 at 24. The United States is not unsympathetic to the fact that this is "an extremely complex modeling problem," but such difficulty only stiffens the need for reliability. U.S. WWSP Br. at 6.

The United States introduced a series of exhibits comparing the Stateline flows predicted by the revised H-I model with those actually observed. This was done on both an annual and monthly basis, and certain exhibits excluded the extraordinarily high flood flows of several "outlier" months; these last exhibits are the ones I have used for comparative purposes. Observed Stateline flows are tabulated in U.S. Exhibit 24*, predicted flows in U.S. Exhibit 25*, and the differences in U.S. Exhibit 26*. In 6 of the 10 years in which the WWSP was simulated, the error between predicted and observed flows exceeded 30 percent. The largest overprediction was 31,416 acre-feet (for 1979), while the greatest underprediction was 19,526 acre-feet (for 1978). In the three years in which the error was less than 10 percent, the magnitude of the difference in flows still averaged 12,251 acre-feet.

The United States contrasts these figures with average annual net depletions from the WWSP of only 1538 acre-feet. U.S. WWSP Br. at 28. However, this is not the

amount of Kansas' claim since this depletion estimate is the result of two very large months of accretions.[141] When these accretions for these months are removed, Kansas claimed depletions from the WWSP average 4,739 acre-feet per year. U.S. Exh. 18; RT Vol. 118 at 69-70.

The United States' experts also presented an "error analysis" of the predicted versus observed Stateline flows on a monthly basis. U.S. Exh. 29. For the period of time before the WWSP was in operation (1950-75), monthly Stateline flows averaged over 10,500 acre-feet, excluding the outlier months. U.S. Exh. 24*; U.S. WWSP Br. at 26. During this time, the absolute average error in the monthly model predictions was 3,642 acre-feet.[142] U.S. Exh. 29. For the period of 1976-85 when the WWSP was in place, this average monthly error was 3,793 acre-feet, and for 1980-85 it increased to 4,566 acre-feet. *Id.* Monthly predicted and observed flows are shown on U.S. Exhibit 36, together with the monthly impact of the WWSP as calculated by the revised H-I model. For the 1976-85 period, predicted flows exceeded actual flows by an average (not absolute average) of 2,084 acre-feet per month. RT Vol. 118 at 85. This can be contrasted with average predicted depletions of 475 acre-feet per month, or 128 acre-feet if accretions are considered. *Id.*

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[141] 17,416 acre-feet in May, 1985 and 13,889 acre-feet in June, 1985. U.S. Exh. 18; RT Vol. 118 at 67-71.

[142] As used by the United States, the concept of absolute average error sums up the actual amount of error that occurred for each month, rather than a long-term average which allows positive and negative values to cancel out. Helton used the term "mean monthly absolute deviation" to describe the same concept.

Mr. Charles W. Binder, one of the United States experts, acknowledged that during the pre-WWSP period (1951-75) the revised H-I model had "virtually no error" when considering long-term, average annual results.[143] *Id.* at 85-86. However, during the WWSP years, the United States evidence showed that the Kansas model overpredicted Stateline flows by an average of some 13,507 acre-feet a year. U.S. Exh. 26*. Binder testified that this change indicates errors in the model that do not allow it to predict accurately during the period of the WWSP operation. RT Vol. 118 at 72, 85-86, 88.

Kansas argues strongly that it is a "fundamental misconception" to evaluate the accuracy of the revised H-I model by comparing predicted to observed flows. RT Vol. 142 at 25-26, 55. To be sure, the model was calibrated against actual, historic flows. Yet, Stateline depletions are not determined on that basis, but rather by taking the difference between two model runs that reflect different institutional conditions. As Mr. Larson testified, this permits errors in data or assumptions to cancel out since they are common to both runs. RT Vol. 99 at 29-30; see also RT Vol. 101 at 19-20, 22, 25; RT Vol. 118 at 100. The model has always been viewed as a better predictor of *changes* in Stateline flows than as a predictor of actual Stateline flows. RT Vol. 44 at 91-92; RT Vol. 51 at 72. However, in assessing the WWSP impacts, Kansas compared two hypothetical situations without a common base. Kansas did not model the real WWSP, as it has been operating. Under those circumstances I do not find it

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[143] The model underpredicted by about 2,500 acre-feet per year. U.S. Exh. 26*.

inappropriate to consider actual flows and conditions in evaluating the model results.

To prove that the WWSP caused a material decline in Stateline flows, Kansas computed the difference between flows from two model runs, each of which has the 1980 Operating Plan simulation removed. These are the WWSP run (HHCH), and the winter irrigation run when the WWSP was not simulated (HCCH). Kansas argues that it was necessary to turn the switch "off" on the 1980 Operating Plan because the plan and the WWSP are so closely tied together; if the model run does not include the WWSP, it is said that operation of the 1980 Operating Plan should not be simulated either. In effect, experts for Kansas made the engineering judgment that the 1980 plan would not continue without the WWSP. As a result, there is no model run that reflects actual historical conditions. RT Vol. 142 at 90. In simulating the WWSP, Kansas does not include winter storage in John Martin Reservoir, although Amity, Las Animas and Fort Lyon actually stored winter water in that reservoir under the WWSP.

Both the United States and Colorado also point out that certain problems present in the WWSP runs will not cancel out because the errors are not parallel. For example, one of the principal factual issues concerns the amount of evaporation occurring from winter irrigation. The United States and Colorado both claim that Kansas has underestimated this figure. To the extent this is true, return flows are increased and Stateline flows become larger. However, if indeed Stateline flows are in error, there would be no comparable overstatement of streamflows in the companion WWSP run because in that run winter water is stored, and not subjected to evaporation

from bare fields. The issue of winter soil evaporation is discussed more fully in the following subsection.

The H-I model also overpredicts the amount of water actually put into storage by about 141,500 acre-feet. Colo. Exh. 894. Colorado calls this a "real error" that does not "wash out against anything." RT Vol. 143 at 62-63. In the comparison simulation, that is in the model run without the WWSP being operated, there is no comparable storage figure. Instead, it is assumed that winter flows are applied directly to bare fields for irrigation.

The United States also joins in many of the general criticisms of the revised H-I model made by Colorado.[144]

E. Accretions from the WWSP.

Finally, both the United States and Colorado urge that accretions must be considered when evaluating the impacts of the WWSP. If this is done in conjunction with the usable flow analysis recommended in Section XXI of this Report, the revised H-I model reduces depletions to 2,200 acre-feet for the whole nine year program, or calculates an actual increase in Stateline flows, depending

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[144] Besides winter evaporation issues, the United States complains about the use of the WTADD factor to limit winter diversions; the use of a 10% tailwater factor that is too high; the diversion reduction factor; the artificial reduction of canal capacities; assumptions re Kansas demands affecting releases from the conservation pool; the assumption of linearity of the groundwater model; failure to match monthly diversions; overprediction of off-channel storage during the WWSP simulation; and departures from actual timing and amounts in simulating storage in John Martin Reservoir.

upon how the institutional switches are set for the 1980 Operating Plan. Colo. Exh. 975, Comparisons 3, 7. Kansas objects, noting that of the 37,000 acre-feet of accretions occurring during the 1976-85 period, 31,000 acre-feet occur in two months in 1985, right at the end of the period. Kan. Exh. 565*** at 8. However, the timing of any accretions (as well as depletions) becomes a product of the assumptions and parameters used in the modeling effort. It seems likely that a reservoir storage program could well provide some usable accretions that would mitigate depletions.

The evidence shows that in seven of the nine years during which the WWSP operated, the H-I model put more water into storage in John Martin Reservoir than actually occurred. U.S. Exh. 8; Colo. Exh. 899. As a result of this artificial storage buildup, the model calculated that John Martin Reservoir filled in 1985, finally producing a model spill of 255,000 acre-feet. Colo. Exh. 980. An actual spill did occur in that year, but it amounted to only 87,000 acre-feet. *Id.* The United States and Colorado thus argue that the H-I model held water in storage that in truth moved downstream over the years to add to Stateline flows. However, in terms of model results, when the stored water was spilled during two months in 1985, the flows show up as "accretions." And Kansas disregards such flows as not being usable or timely if they are to be used to reduce depletions that occurred earlier in the WWSP period. There is not sufficient evidence to determine what the impact on Stateline flows would have been if the H-I model had more closely corresponded to actual storage in John Martin Reservoir and to actual releases.

However, there seems to be merit in Colorado's argument, with respect to the WWSP and accretions, that the H-I model has created "false depletions." RT Vol. 142 at 80.

F. Winter Irrigation Evaporation.

Whether the WWSP does result in Stateline depletions depends on a comparison of consumptive use under the program with prior winter irrigation practices. Kansas maintains that storing the winter river flows in reservoirs, and then applying that water to irrigated crops in the summer, uses more water than simply irrigating bare fields in the winter. On first impression, this would seem to be true. Indeed, that was even Schroeder's reaction, that is, that the program "would seem to deplete the state line flow." RT Vol. 111 at 143-45. However, the issue is much more complex than first appears, and a great deal of highly technical evidence was introduced on the subject. The issue turns largely on the amount of evaporation from bare soil that is assumed during the period when winter irrigation was practiced.

When water is applied to bare soil in the winter, the water at or near the soil surface evaporates at a high rate. The United States' expert testified that the evaporation rate from wet soil is at or near the rate of lake evaporation. RT Vol. 136 at 52-53. Water that is not evaporated is stored in the soil profile and held there against gravity until the water-holding capacity is exceeded. The excess then percolates down to the next layer of soil or into deep percolation. *Id.* at 20-34. The water retained in the soil

profile is either evaporated at a slower rate, or is available for use by the crop during the next growing season. *Id.* at 47-52; RT Vol. 114 at 147-155. Of course, there is also a certain amount of tailwater runoff that reaches the river from such winter irrigation. The amounts of water that are evaporated, or retained in the soil profile for crop consumption, or percolate into the groundwater, vary with the season, soil, weather, and amount and timing of applied irrigation water.

The physical process of soil evaporation involves two separate phases or "stages." The first phase occurs when the top profile of soil, from four to six inches, is wet, and the rate of evaporation is limited by the evaporative capacity of the air. Colo. Exh. 659. During the second stage, after the top of the soil has dried out, evaporation still continues but at a slower rate. RT Vol. 136 at 74; U.S. Exh. 61 at 48. However, soil evaporation from water applied to bare fields in the winter is not well documented in the literature. Colo. Exh. 659. Much of the available data relate only to soil evaporation during the growing season.

For use in the development of the H-I model, Kansas' experts prepared a memorandum reviewing the available information about winter evaporation. Colo. Exh. 659. As a result, Kansas adopted a modified Blaney-Criddle equation for the determination of winter soil evaporation. Book testified that he knew of four prior studies along the Arkansas River where this methodology had been used to determine winter soil evaporation. RT Vol. 126 at 92-96. The engineering data used in one of these studies involving the Kessee ditch had been submitted to and approved by the engineering committee of the Arkansas

River Compact Administration. *Id.* at 92-93. In its application of the Blaney-Criddle equation in the H-I model, Kansas applied a coefficient of .2 for potential evapotranspiration (PET). From all the data available, Book believed that this was a reasonable figure. RT Vol. 126 at 105.

Colorado, on the other hand, employed a formula known as the Ritchie equation for the determination of winter soil evaporation. This methodology was strongly supported by the United States; indeed, the United States' expert testified that not only was the Ritchie formula by far "the best way of calculating soil evaporation," but that other methods were "not even appropriate."[145] RT Vol. 136 at 96. Colorado's use of the Ritchie equation produces higher amounts of winter soil evaporation than the Kansas analysis. The difference is approximately 15%, or an average of about 12,000 acre-feet annually for the 1950-85 period. RT Vol. 125 at 74-75; RT Vol. 126 at 133, 146-47; Colo. Exh. 862. Of course, higher estimates of evaporation from winter irrigation reduce the historic contributions to the river from such winter diversions, and lessen any depletions under the WWSP.

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[145] Testimony of Dr. Robert D. Burman, Professor Emeritus of Agricultural Engineering at the University of Wyoming. His resume is U.S. Exh. 60. Dr. Burman chaired the American Society of Civil Engineers' Committee on Irrigation Water Requirements for over ten years, and is the co-author of the ASCE publication, "Evapotranspiration and Irrigation Water Requirements."

Colorado argued that the PET used in the revised H-I model acted as a ceiling and did not allow evaporation to increase with larger applications of irrigation water. RT Vol. 138 at 58. Schroeder, therefore, made a change to the revised H-I model. He removed the PET cap so that evaporation was calculated in a manner similar to that in Colorado's water budget. RT Vol. 138 at 64, 67; RT Vol. 139 at 65. The result of this one change essentially cut the depletions calculated by the revised H-I model in half.[146] Colo. Exh. 1012, Comparison 4. However, Kansas objected that such a change was not appropriate, claiming that the H-I model is a "one-layer" model. To remove the PET cap allows access to the entire soil moisture reservoir. RT Vol. 125 at 76. An increase in the PET results in a like amount of actual consumption in the Kansas model. *Id.* This is unlike the Colorado "two-layer" model, which can isolate part of the soil moisture, not allowing it to evaporate. *Id.* Schroeder also acknowledged that he did not recalibrate the revised H-I model after his change. RT Vol. 139 at 64. Thus, while Schroeder's results may not be appropriate or reliable, they do emphasize the importance of accurate winter evaporation data in evaluating the WWSP.

On surrebuttal, the United States called Dr. Burman as an expert witness on the evaporation issue. His principal points were that the PET coefficient used by Kansas was too low, and that Kansas should have employed the Ritchie equation instead of the modified Blaney-Criddle

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[146] Total depletions from the WWSP were reduced from 53,440 acre-feet to 25,532 acre-feet. Similar reductions occurred in depletions of usable flow.

methodology.[147] He pointed out that the Kansas approach cannot be adjusted to reflect the different number of irrigation applications or "wettings." RT Vol. 136 at 98. The H-I model recognizes only average wettings, with the result that it does not properly simulate stage one events and underestimates actual evaporation. RT Vol. 137 at 9-10. The Ritchie equation, on the other hand, addresses both stages of evaporation and the wetting frequency. However, the Ritchie equation requires the use of a two-layer model. RT Vol. 126 at 97-98, 108. While the Ritchie equation may be more refined, and possibly more accurate, it cannot be used in a one-layer model like the revised H-I model. *Id.*

It is not clear, however, that reasonable results can be obtained only through the use of the Ritchie equation. While Dr. Burman is described by counsel for the United States as "one of the most knowledgeable experts in the world in the physical processes that govern the consumption of irrigation water," he knew of no instance, apart from this case, where the Ritchie equation had been used to model the evaporation of winter irrigation water. RT Vol. 137 at 52, 60. He himself had never applied the Ritchie equation to winter soil evaporation. RT Vol. 135 at 98. Apart from work in another current case, he had never developed a computer program to model soil moisture accounting. *Id.* at 90, 96. Indeed, he had never made a study of evaporation from bare soil. RT Vol. 137 at 52-53; RT Vol. 135 at 97. Moreover, he acknowledged that

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[147] Another U.S. expert, however, appears to have used Blaney-Criddle in the early stages of his investigation. RT Vol. 119 at 117.

the Ritchie equation should be applied on a daily timestep, and that the required records of lands on which water was used are not available on a daily basis. RT Vol. 137 at 52-53, 58-59. He had no opinion on what the proper value for PET should be, although in his view the Kansas modeling approach did not lend itself to an appropriate PET value. RT Vol. 137 at 12.

The weight of his testimony was subject to further question by the fact that the form of the Ritchie equation published in his 1990 book was incorrect.[148] RT Vol. 137 at 22-26, 30, 32; Kan. Exh. 699. This might not be a worthy consideration (counsel for the United States says the error was a typographical mistake only) except for the persistent cross-examination that was required to get him to appreciate the error. Moreover, his testimony on the stage one evaporation portion of the equation was far from clear. His own calculations applying the Ritchie formula omitted a reduction called for by the equation. RT Vol. 137 at 14-22, 102-04. He used "straight lake evaporation" as opposed to applying a 10 percent reduction included within the equation. *Id.* at 103.

In the final analysis, modeling winter evaporation depends not only upon the equation used but also on the amounts and frequency of the irrigation applications, and weather conditions at those times. However, that determination need not be made in order to decide the present WWSP claim. I have concluded that the depletions shown

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[148] The equation is 4.11 on page 49 of U.S. Exh. 61. This is commonly known as Manual 70, published by American Society of Civil Engineers, entitled *Evapotranspiration and Irrigation Water Requirements.*

by the Kansas model are well within the model's range of error. One cannot be sure whether impact or error is being shown. Nonetheless, it is evident that winter evaporation is an important factor in evaluating the WWSP, and one would hope that appropriate field studies could eventually be made to provide more reliable evidence on this issue.

G. Conclusions re WWSP.

I conclude that Kansas is not barred by equitable considerations from pursuing a claim under the compact against the operation of the Winter Water Storage Program. However, even if the standard of proof is a preponderance of the evidence, I find that Kansas has not proved that the WWSP has caused material Stateline depletions. Kansas' case has not been helped by its own contradictions in quantifying impacts to usable flow – ranging during this trial from 255,000 acre-feet initially, to 44,000, to 40,000; nor by the fact that depletions are essentially eliminated if accretions are taken into account. This is not to say that the WWSP has not adversely impacted Stateline flows, but rather that Kansas has failed to prove that it has.

SECTION XXIII

RECOMMENDATIONS

The trial in this case was bifurcated into a liability and a remedy phase. This Report presents my recommendations on the issue of liability with respect to the various claims of the states.

The major issue in the trial, and in Part I of this Report, is whether postcompact well pumping in Colorado has violated Article IV-D of the Arkansas River Compact. I recommend that the Court find that such a violation has occurred, and that Kansas prevail on this issue. With respect to Kansas' additional claim concerning the Winter Water Storage Program, I recommend that the Court find that Kansas has failed to prove that operation of the program has violated the compact.

Four other liability issues were decided on motion, either before the trial began or after evidence was received. With respect to these issues, I recommend that the following decisions be confirmed:

(a) Granting Colorado's motion for partial summary judgment on the legal issue of whether the Winter Water Storage Program in Pueblo Reservoir was subject to the approval of the Arkansas River Compact Administration. This decision is Part II of this Report.

(b) Granting Colorado's motion to dismiss the Kansas claim arising from the operation of Trinidad Reservoir. This decision is Part III of this Report.

(c) Granting Kansas' motion to dismiss Colorado's "Lake McKinney Counterclaim." This decision is Part IV of this Report.

(d) Granting Kansas' motion to dismiss Colorado's "Well Counterclaim." This decision is Part V of this Report.

If the Court finds, in accord with this Report or otherwise, that the Arkansas River Compact has been violated, then I recommend that the case be remanded for further evidence and conclusion of the remedy phase of the trial.

DATED: July 1994

Respectfully Submitted,

ARTHUR L. LITTLEWORTH,
Special Master

No. 105, ORIGINAL

In The

Supreme Court of the United States

October Term, 1985

STATE OF KANSAS,

Plaintiff,

v.

STATE OF COLORADO,

Defendant,

and

UNITED STATES OF AMERICA,

Defendant-Intervenor.

ARTHUR L. LITTLEWORTH, Special Master

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REPORT – PART II

REPORT OF SPECIAL MASTER RE
WINTER STORAGE MOTIONS

IN THE SUPREME COURT OF THE UNITED STATES

STATE OF KANSAS, Plaintiff, v. STATE OF COLORADO, Defendant.	)	No. 105, Original October Term, 1985

REPORT OF SPECIAL MASTER RE WINTER STORAGE MOTIONS

(Filed Sept. 15, 1989)

Colorado has filed several motions concerning the so-called winter storage program. These consist of a Motion for Partial Summary Judgment on the 1951 Resolution, a Motion to Stay Review of Kansas' Claim of Injury from the Winter Storage Program, and Motions to Strike Portions of the Affidavits of Douglas R. Littlefield, Ph.D. and Carl E. Bentrup filed on behalf of Kansas. In support of these motions, Colorado has submitted several affidavits and four large volumes of accompanying documents. Many date back to the events leading up to the adoption of the Arkansas River Compact in 1949. The United States, now having intervened in this case, also filed a brief in support of Colorado's Motion for Partial Summary Judgment. Kansas, in reply, filed three volumes of additional documents, together with the Littlefield and Bentrup Affidavits. All parties agreed that these motions could be decided by the Special Master without oral argument.

Colorado's Motion for Partial Summary Judgment

In its Complaint Kansas contends, among other allegations, that any reregulation of the native waters of the Arkansas River must be approved by the Compact Administration, pursuant to a Resolution adopted by the Compact Administration on July 24, 1951 (hereinafter the "1951 Resolution"). Colorado seeks a determination through its Motion for Partial Summary Judgment that such approval by the Compact Administration is not legally required.

The issues arise out of the winter storage program in Pueblo Reservoir, a part of the Fryingpan-Arkansas Project authorized by Congress in 1962. 43 U.S.C. §§ 616-616f (1962). Pueblo Dam is located on the mainstem of the Arkansas River approximately six miles west of the City of Pueblo, Colorado, and is owned and operated by the United States, through the Bureau of Reclamation. The Fryingpan-Arkansas Project brings water from the Colorado River Basin west of the Continental Divide into the Arkansas River Valley of Eastern Colorado, storing such water in Pueblo Reservoir. In addition, Pueblo Reservoir provides storage space for the reregulation of private water rights. This reregulation involves the storage of "native" waters of the Arkansas River which were historically diverted by water users in Colorado for irrigation use during the winter months, but which now are stored for later release during the months of peak crop demand (hereinafter the "winter storage program").

The 1951 Resolution consisted of certain "comments and recommendations" made by the Compact Administration to the Governors of Colorado and Kansas with

respect to the then proposed Fryingpan-Arkansas Project.[1] The Resolution sets out the Compact Administration's understanding of the proposed project, namely, that approximately 70,000 acre-feet of water a year would be imported from the Colorado River Basin into the Arkansas River Basin for supplemental irrigation and domestic water supplies in Colorado; and further, that the project would involve the reregulation of native waters of the Arkansas River. Noting its concern over the reregulation of native waters, the Compact Administration recommended to the Governors of Colorado and Kansas, "and expressed as a policy of the Arkansas River Compact Administration," that the proposed Federal project be approved, but on the condition that there would be no reregulation of native waters of the Arkansas River until a plan therefor had been submitted to, "and approved by," the Arkansas River Compact Administration and the affected water users. The full text of the 1951 Resolution is attached to this Report.

Colorado's argument on its Motion for Partial Summary Judgment begins with an analysis of the Arkansas River Compact, and the powers granted therein to the Compact Administration. The Compact was approved by Congress in 1949, and is now a law of the United States. 63 Stat. 145 (1949); *See Texas v. New Mexico*, 462 U.S. 554, 564 (1983); *Cuyler v. Adams*, 449 U.S. 433, 438 (1981). The

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[1] At that time the project was known as the "Gunnison-Arkansas Project, Roaring Fork Diversion." The Gunnison-Arkansas Project was ultimately scaled down, and the Roaring Fork Diversion Unit was renamed the Fryingpan-Arkansas Project, and authorized for construction in 1962.

Compact Administration can exercise only those powers provided in the Compact ratified by Kansas and Colorado, and approved by Congress under the Compact Clause of the United States Constitution. The Compact Administration cannot, by its own action, expand its powers; nor can a court order relief inconsistent with the express terms of the Compact. *Texas v. New Mexico*, 462 U.S. 554, 564 (1983); *West Virginia ex rel. Dyer v. Sims*, 341 U.S. 22, 28 (1951).

Colorado maintains that the Compact Administration never had, and was never intended to have, the power to require its approval of any reregulation of the native waters of the Arkansas River. Specifically at issue now is the winter storage program in Pueblo Reservoir, a Federal facility. The practical question is whether the winter storage program can be implemented without the prior approval of the Compact Administration. The United States supports Colorado in the view that the express language of the Compact demonstrates that it was not intended to impede the implementation of Federal projects. Presumably, however, both Colorado and the United States agree that the Compact Administration has the authority to *investigate* any impact that the winter storage program might have on Kansas' entitlement under the Compact. Moreover, any future development or program must be consistent with the substantive requirement in the Compact that the waters of the Arkansas River ". . . shall not be materially depleted in usable quantity or availability for use to the water users in Colorado and Kansas. . . ." Arkansas River Compact, Ch. 79, 59 Stat. 53, Article IV-D.

Colorado points initially to Article VI-A(2), which provides:

> "Except as otherwise provided, nothing in this Compact shall be construed as supplanting the administration by Colorado of the rights of appropriators of waters of the Arkansas river in said State as decreed to said appropriators by the courts of Colorado . . . nor as curtailing the diversion and use for irrigation and other beneficial purposes in Colorado of the waters of the Arkansas River."

Colorado argues that any requirement that the Compact Administration must approve the reregulation of native waters would, in fact, supplant Colorado's water rights administration in contravention of this Article.

Article IV-D of the Compact is also cited in support of Colorado's motion. It provides:

> "This Compact is not intended to impede or prevent future beneficial development of the Arkansas River Basin in Colorado and Kansas by Federal or State agencies, by private enterprise, or by combinations thereof, which may involve the construction of dams, reservoirs and other works for the purposes of water utilization and control, as well as the improved or prolonged functioning of existing works: Provided, that the waters of the Arkansas River, as defined in Article III, shall not be materially depleted in usable quantity or availability for use to the water users in Colorado and Kansas under this Compact by such future development or construction."

Finally, Colorado relies on Article VIII-H, arguing that the enforcement authority of the Compact Administration is limited to making investigations, findings, and recommendations; and that the Administration was not delegated authority to enforce the proviso of Article IV-D by requiring its prior approval of future development or construction. Article VIII-H provides:

> "Violation of any of the provisions of this Compact or other actions prejudicial thereto which come to the attention of the Administration shall be promptly investigated by it. When deemed advisable as the result of such investigation, the Administration may report its findings and recommendations to the State official who is charged with the administration of the water rights for appropriate action, it being the intent of this Compact that enforcement of its terms shall be accomplished in general through the State agencies and officials charged with the administration of water rights."

Kansas properly points out that this provision deals only with a "violation" of the Compact, and it is the position of Kansas that the Administration has the right of approval in order to *prevent* Compact violations. Nonetheless, Article VIII-H, coupled with the requirement that any action by the Compact Administration be approved by the representatives of both States, underscores the limited direct enforcement powers of the Compact Administration.[2]

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[2] The history of the Compact negotiations shows a successive weakening of the powers originally proposed for the Compact Administration. For example, early proposals would have

Viewing all of these provisions, the United States concludes:

> "Taken together, these Compact Provisions confirm that the Compact parties did not give the Compact Administration the authority to block the implementation of programs like the winter storage program by withholding its approval of the necessary operating principles. Instead, the Compact clearly contemplates that the Compact Administration will play only an investigatory role, to determine whether projects like the winter storage program at Pueblo Reservoir, comply with the provisions of the Compact." Response of the United States to Colorado's Motion for Partial Summary Judgment and Colorado's Motion to Stay at 15.

All parties, however, go beyond the provisions of the Compact itself. Both Colorado and Kansas review the extensive documentary record of the negotiations leading to final approval of the Arkansas River Compact. The authority to negotiate such a Compact was granted by Congress in 1945, subject to the condition that a person appointed by the President participate as a representative of the United States. Arkansas River Compact, Ch. 79, 59 Stat. 53. The United States Representative was General

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made Administration findings of fact conclusive in subsequent court proceedings, and would also have allowed the Administration to institute appropriate legal action in the event the States failed to act. Record, Colorado-Kansas Arkansas River Compact Commission at 15-25; 15-46-47. Both of these powers were finally dropped. Record, *id.* at 15-58; 17-83-84. Kansas says that Article VIII was "gutted" of any real enforcement provisions. Kansas' Response to Colorado's Motion for Partial Summary Judgment at 22.

Hans Kramer, U.S. Army Corps of Engineers, (Ret.), and he was elected Chairman of the negotiating Commission. Both States rely upon such documentary evidence to help establish intent. When the interpretation of a Compact is at issue, the record of the negotiations may be used to ascertain the meaning intended by the parties. *See Texas v. New Mexico*, 462 U.S. 554, 568 n. 14 (1983); *Arizona v. California*, 292 U.S. 341, 359-60 (1934).

Although the Fryingpan-Arkansas Project was not approved by Congress until 1962, both States acknowledge that the forerunner of the Project (under the name of the Gunnison-Arkansas Project) was being investigated at the same time that the Arkansas River Compact was being negotiated. Colorado's Brief at 37; Kansas' Response at 11. Indeed, the Project was specifically discussed during those negotiations.

The Special Master has studied the voluminous record of the Compact negotiations submitted by both States, and concludes that the record does not support Kansas' claim that the Compact negotiators intended to vest the Compact Administration with ". . . the authority to approve or disapprove any future federal development that might undermine the status quo as established by the Compact." Kansas' Response at 34. Indeed, specific reference to a right of "approval" does not appear anywhere in the historical record.[3] Although Kansas claims that

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[3] It is interesting that the affidavit of Douglas R. Littlefield, Ph.D., the historian retained by Kansas, speaks only of the right to "review and comment" on plans for the reregulation of native waters of the Arkansas River, and not the right of approval which Kansas claims was intended by the Compact negotiators. Kansas' Response at 2.

such authority may be "implied" (*id.* at 30), nothing in the record supports a conclusion that the Compact Administration was intended to have greater authority than is evident from the Compact itself. The powers of the Compact Administration were carefully circumscribed.

Kansas argues that the Colorado motion puts the "intent of the parties" at issue. Perhaps, therefore, the most expeditious way to address the issue is first to review the documentary evidence on which Kansas relies.

Kansas claims that the original version of the present Article IV-D was intended ". . . to provide the Compact Administration with the express authority to review future proposals and plans under the terms of the Flood Control Act of 1944," and this was the means ". . . to ensure that future developments would have to be approved by the Compact Administration." *Id.* at 36-37. General Kramer did, in fact, draft a provision that would have incorporated the policy and procedure set forth in Section 1 of the Flood Control Act of 1944 into the Compact. Flood Control Act of 1944, Ch. 665, 58 Stat. 887. He sent the draft to Colorado Commissioner Henry C. Vidal, Chairman of the Commission's Legal Affairs Committee, under a covering letter dated September 30, 1946, which stated in part:

> "As you know, we have had some discussions in previous meetings of the Colorado-Kansas Arkansas River Compact Commission regarding compact provisions with respect to future plans and projects affecting the waters of the Arkansas River which may be developed by the War Department or by the Department of the Interior. I advanced the thought at one of

> our meetings that the compact might meet this situation by including a clause whereby the coordinating procedure between Federal Departments and affected States established in the Flood Control Act of December 22, 1944, would be extended in application to the body to be established for administering the Arkansas River Compact." Kansas' Response to Colorado's Motion to Stay and Motion for Partial Summary Judgment, Exhibit 110.

The actual draft language prepared by General Kramer notes that under the Flood Control Act of 1944 the Federal agencies were required ". . . to submit plans, proposals or reports to the affected State or States." *Id.* The reference to that Act was intended to have ". . . the effect of requiring such submittal also to the Arkansas River Compact Administration in the case of any investigation, plan, proposal or report which may affect the waters of the Arkansas River or any provision of this Compact." *Id.* Significantly, General Kramer did not propose that Federal plans could not proceed unless *approved* by the Compact Administration. The statement in the Kansas brief that the Kramer draft required all future Federal plans to be submitted "for approval" overstates the plain provisions of the Kramer document. Kansas' Response at 13.

General Kramer's draft provision was not incorporated into the Compact. However, at least one later proposed Compact Article, numbered XI, also made express reference to the Flood Control Act of 1944. Kansas' Response, Exhibit 112 at 4-6. The reference in the draft Article, however, appears to be more concerned with the so-called "paramountcy" issue than with any requirement

of submitting Federal plans to the Compact Administration. The paramountcy clause in the Flood Control Act of 1944, as applied to the Arkansas River, would have made navigation and power subservient to irrigation use. The proposed Article XI draft brought opposition from the Federal Power Commission. As Kansas acknowledges, a "watered-down version" of Article XI was then proposed which stripped the Article of any reference to specific Federal statutes, Kansas' Response at 14. But even the revised Article XI was objected to by both the War Department and the Department of Interior. Kansas acknowledges that this opposition forced the deletion of both the proposed Articles X and XI from the Compact draft. *Id.* at 16, 38-39.

Thus, none of the draft provisions on which Kansas relies were finally included in the Compact. Kansas says the Compact negotiators finally "agreed to rely on the provisions of existing federal law" in relation to future developments on the river. But even if this argument is accepted, the law did not provide that the affected States, or the Compact Administration, would have the power of approval over the construction or operation of Federal projects. The Flood Control Act of 1944 provides only that Federal plans and proposals will be submitted to "affected states" for their "views and recommendations," and that such "views and recommendations" will be included among the documents submitted to Congress. Flood Control Act of 1944, Ch. 665, § 1(a) and (c), 58 Stat. 887. It does not give any State the power to approve or disapprove Federal projects.

In its brief, Kansas slips back and forth between two differing statements of its position. At times, Kansas states that the Compact Administration was intended to have the authority to require the "submission" of plans for Federal projects; that the Administration wanted "an official say" concerning future plans for the reregulation of native waters, "even if that say was channeled through the governors of Kansas and Colorado." Kansas' Response at 9, 16, 30, 33. In other places, Kansas states that a right of "approval" was intended. Kansas' Response at 12-13, 34-35, 37, 41. When using "approval," the Special Master understands Kansas' position to be that any project involving the reregulation of the waters of the Arkansas River cannot proceed without the approval of the Compact Administration. The 1951 Resolution says there shall be no reregulation of native waters "until" a plan of operation has been "submitted to, and approved by," the Compact Administration. In 1985 the Kansas Attorney General confirmed Kansas' position that the 1951 Resolution was a bilateral decision precluding reregulation of the native waters of the Arkansas River "until a plan of operation had been approved by the Administration." Colorado's Motion for Partial Summary Judgment on the 1951 Resolution, Exhibit 27 at 5-6.

Clearly there is a difference between merely requiring Federal plans to be submitted to the Administration, and giving that Administration a veto power over the construction or operation of such projects. At best, the historical record suggests that some Compact negotiators wanted, and perhaps expected, that plans for future Federal development would be submitted not only to the affected States, but also to the Compact Administration.

However, the historical record does not support Kansas' claim that the Compact negotiators intended to give the Compact Administration power to control future Federal operations on the Arkansas River.[4]

The 1951 Resolution, adopted two years after the approval of the Arkansas River Compact, did not assert that the Compact Administration already possessed independent authority over the Fryingpan-Arkansas Project. Rather, that Resolution was framed merely in the form of a recommendation to the Governors of Kansas and Colorado. The 1951 Resolution came about in response to the Feasibility Report on the Fryingpan-Arkansas project issued by the Bureau of Reclamation. In 1951, that report was transmitted by the Secretary of the Interior to Kansas and Colorado for their written views and recommendations as required by Section 1(c) of the Flood Control Act of 1944. *Id.*, Exhibit 62. At the request of its Chairman, the Compact Administration was also furnished a copy. *Id.*, Exhibit 69 at 3. The Compact Administration composed its comments in the form of the 1951 Resolution, and asked the Governors of Colorado and Kansas to transmit

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[4] In his report to Congress on the proposed Compact, General Kramer made only the following modest statement with respect to future Federal plans: "It is to be presumed that the Federal agencies will respect the above provisions as a matter of course in their development plans for the Arkansas River basin. It is also presumed by the compact negotiators that when such plans are submitted to the Governors of the affected States, pursuant to the provisions of the Flood Control Act of December 22, 1944, the Governors of Colorado and Kansas will be especially mindful of the protective provisions of Article IV-D in formulating their official views and recommendations." Colorado's Motion, Exhibit 59 at 41; *id.*, Exhibit 60 at 36.

it to the Secretary of Interior, along with their respective State's comments and recommendations. This was done. The Secretary of Interior then transmitted the Feasibility Report, and all comments thereon, to Congress to secure authorization and funding for the project. The Secretary did not, however, recommend adoption of the policy included in the 1951 Resolution. H.R. Doc. No. 187, 83rd Cong., 1st Sess. 9-13 (1953).

The submittal made by the Governor of Kansas on the Fryingpan-Arkansas Project expressed his State's concern that reregulation of native waters not be "detrimental" to Kansas, but the Governor made no reference to approval by the Compact Administration for such protection. Instead, he stated only that:

> "We assume, of course, that no such attempt at re-regulation would be made or desired without a meeting of the two states and the United States after completion of the project." Colorado's Motion, Exhibit 62.

The Fryingpan-Arkansas project was not actually authorized by Congress until 1962. The authorizing legislation does not include any provision that the reregulation of the native waters of the Arkansas River be subject to the approval of the Compact Administration. The legislation simply directed the Secretary of the Interior "to construct, operate, and maintain the Fryingpan-Arkansas project Colorado, in substantial accordance with the engineering plans therefor set forth in House Document No. 187, Eighty-Third Congress . . ." 42 U.S.C. §§ 616-616f. The water supply plans and estimated project revenues were based on storage of winter flows in Pueblo Reservoir. H.R. Doc. No. 187 at 32, ¶65; *id.* at 35, ¶70.

Kansas argues, nonetheless, that congressional approval of the project followed "Colorado's assurances" that any reregulation of native waters would be subject to approval of the Compact Administration "as demanded by Kansas." Kansas' Response at 48. The record shows that Representative Avery of Kansas read a letter from the Kansas Water Resources Board referring to the substance of the 1951 Resolution, and concluding that Kansas therefore ". . . assumes that any reregulation of the native waters will be subject to the approval of the compact administration." 108 CONG. REC. 8, 10144 (1962). On the floor of the House, the following exchange then occurred between Representative Avery and Representative Aspinall of Colorado:

> "MR. AVERY. I would like to have the assurance of the chairman of the committee that if this bill is to pass and the project is to be authorized that all management of what is described as 'native water in the Arkansas River' will be submitted for approval by the Kansas-Colorado-Arkansas River Compact Administration.
>
> "MR. ASPINALL. I would answer the gentleman this way: The Fryingpan-Arkansas project has the unanimous consent of the Arkansas River Compact Administration, and the Arkansas River Compact Administration has a representative from Kansas. So the answer is 'Yes,' native waters will be treated as they are supposed to be treated in compliance with the Arkansas River compact." *Id.*

The Aspinall response, however, is hardly as direct or unambiguous as Kansas claims. Certainly it is less than a

clear affirmation that native waters would not be reregulated in the Fryingpan-Arkansas project without the prior approval of the Compact Administration. Colorado also points out that Representative Aspinall was not an officer or agent of the State of Colorado, and in the Committee hearings, the official State position was presented by the Director of the Colorado Water Conservation Board. Colorado's Reply at 49; *Hearings on H.R. 2206, 2207, 2208 and 2209 Before the Subcomm. on Irrigation and Reclamation of House Comm. on Interior and Insular Affairs,* 87th Cong., 1st Sess. 148 (1961).

Moreover, Kansas does not include the response of Representative Rogers of Colorado which was even more equivocal:

> "Further answering the gentleman's question, and emphasizing what the gentleman from Colorado [Aspinall] has said, the gentleman from Kansas [Avery] recognized that there is a compact between the State of Colorado and the State of Kansas which everybody has agreed works perfectly. The enactment of this legislation will not change that situation in any manner whatsoever." 108 CONG. REC. 8, 10145 (1962).

More important, however, such a brief exchange, without consideration of the views of the committee or the affected Federal agencies, hardly seems adequate to establish the intent of Congress on an important Federal issue.[5] Kansas cites *West Virginia ex rel. Dyer v. Sims,* 341

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[5] For example, Kansas does not consider H.R. Doc. No. 694. In describing the project, the Document refers specifically to ". . . the regulation of winter flows amounting to 88,000 acre

U.S. 22 (1951), for the proposition that Colorado should be estopped by the Aspinall statement. But that case was based on a covenant made by the state legislature, not on a response by an individual congressman. Remarks of a single legislator, even the sponsor, are not controlling in analyzing legislative history. *Chrysler v. Brown*, 441 U.S. 281, 312 (1979); *Sierra Club v. Costle*, 657 F.2d 298 (D.C. Cir. 1981). Statements by individual legislators should generally be given little weight when searching for the intent of the entire legislative body. *National Welfare Rights Organization v. Mathews*, 533 F.2d 637, 642-43 (D.C. Cir. 1976); *Castaneda-Gonzalez v. Immigration & Nat. Service*, 564 F.2d 417, 424 (D.C. Cir. 1977). Moreover, had the issue been fully aired, it seems unlikely that Congress would have placed part of the operation of a Federal project in the hands of an administrative body that might be incapable of taking action because of the unanimous consent requirement in the Compact.

The later conduct of the Compact Administration confirms the view that it did not have the power to require prior approval of the winter storage program. Construction of Pueblo Reservoir was completed in 1975 and the first winter storage program was begun that year. Colorado's Motion, Exhibit 55 at ¶5. A winter storage program has been operated in Pueblo Reservoir every

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feet. . . ." H.R. Doc. No. 694 at 4. It states further that the project will be operated ". . . in accordance with the 'operating principles' set out in H.R. Document 130 of the 87th Congress." *Id.* at 12. In turn, House Document 130 sets forth the operating principles adopted by the State of Colorado on April 30, 1959. These operating principles do not include Compact Administration approval of a winter storage program.

winter since that time, with the exception of the winter of 1977-78. *Id.* at ¶12. Kansas admits that it did not raise the 1951 Resolution until 1982. Kansas' Response at 23.

Kansas tries to explain its delay, and the inaction of the Compact Administration, by stating that the winter storage program was referred to in minutes, and by speakers at various meetings, as "experimental," "provisional," and "temporary." Kansas' Response at 23-25. But it might have been expected that the Compact Administration, if it truly had the power, would have wanted to approve the program at its outset. Indeed, its interest might even have been heightened if the program were experimental and its impacts uncertain. Furthermore, the 1951 Resolution does not make any exceptions for experimental programs. It refers to *any* reregulation of the native waters of the Arkansas River.

The initial operating plan for the winter storage program was developed by the Southeastern Colorado Water Conservancy District ("Southeastern District") and the participating water users with the assistance of the Bureau of Reclamation, the U.S. Geological Survey, and Colorado water officials. Colorado's Motion, Exhibit 55 at ¶¶9, 10. A repayment contract between the Southeastern District and the United States for winter storage in Pueblo Reservoir was signed in 1965. *Id.*, Exhibit 67; *id.*, Exhibit 55 at ¶¶5, 45. Meetings to develop the winter storage program began in 1969 between representatives of the Southeastern District and Colorado water users in the Arkansas Valley. *Id.*, Exhibit 55 at ¶¶9, 11. The program, with the assistance of the Bureau of Reclamation, the U.S. Geological Survey, and the Colorado Division Engineer, was finalized in 1975. *Id.*, Exhibit 55 at ¶¶11

and 14. Following agreement on an operating plan, the negotiating committee was reformulated as the Board of Trustees of the Winter Storage Program. *Id.*, Exhibit 55 at ¶14.

The Chairman of the Winter Storage Committee of the Southeastern District, and later the Chairman of the Board of Trustees of the program, was Charles L. ("Tommy") Thomson, General Manager of the Southeastern District. He appeared at several meetings of the Compact Administration from 1970 to 1975, at which he discussed the planning for the winter storage program. *Id.*, Exhibit 55 at ¶10. He then appeared at the December, 1975, annual meeting of the Compact Administration, and advised the Administration of the start of the winter storage program. *Id.*, Exhibit 55 at ¶¶16, 17; *Id.*, Exhibit 71 at 7. No objection to the commencement of the program was raised either by the Compact Administration or Kansas. *Id.*, Exhibit 55 at ¶17. Nor was there any mention of the 1951 Resolution, or the right of the Compact Administration to approve the program before it was implemented.

Instead, the Compact Administration merely adopted a Resolution directing its Special Engineering Committee to review the operations of the Fryingpan-Arkansas Project, and to report to the Compact Administration at each annual meeting on the relationship between the project and the Arkansas River Compact. *Id.*, Exhibit 55 at ¶19; *id.*, Exhibit 71 at 8. Mr. Thomson was also requested to appear at the next meeting of the Compact Administration to report on the results of the program, and he did this in May, 1976. *Id.*, Exhibit 55 at ¶21; *id.*, Exhibit 72 at 5-9. Beginning in 1975, the Secretary of the Compact

Administration began attending the meetings of the Board of Trustees of the Winter Storage Program, and in 1977, Mr. Carl Bentrup, one of Kansas' Representatives, was appointed to represent the Compact Administration at these meetings. *Id.*, Exhibit 55 at ¶20; *id.*, Exhibit 77 at 54-55.

The actions of the Compact Administration over many years are hardly consistent with a view that the Administration's approval was required before the winter storage program could be implemented. On the contrary, the Administration's conduct supports Colorado's and the United States' views, namely, that the Administration's authority was limited to monitoring and investigating any impact that the winter storage program might have on Kansas' entitlement under the Compact. Any violations of the Compact would be subject to Article VIII.

Given the Special Master's conclusions on the authority of the Compact Administration, it is not necessary to rule on Colorado's additional grounds for its motion; namely, that the 1951 Resolution was modified and superseded, and that Kansas should be precluded from attempting to enforce the policy expressed in the 1951 Resolution on the grounds of laches, estoppel and equitable principles of fair dealing. Colorado maintains that Kansas has accepted the benefits of the winter storage program. Kansas denies these allegations.

Apart from the substantive issues, Kansas also argues that summary judgment on this motion is inappropriate for three reasons: (1) that genuine issues of material fact exist; (2) that summary judgment is strongly disfavored

for resolving questions of intent, such as exist with respect to the 1951 Resolution; and (3) that summary judgment is disfavored for deciding questions in complex litigation.

The fundamental question here involves the powers of the Compact Administration. That is a question of the statutory interpretation of the Arkansas River Compact and the Federal legislation authorizing the Fryingpan-Arkansas Project. Volumes of documentary history have been submitted to aid in such interpretation. While the conclusions to be drawn from this record are certainly at issue, there do not appear to be material issues of fact. Matters of statutory interpretation and application present issues of law, not fact, and in the final analysis, it is ". . . the province and duty of the judicial department to say what the law is." *Diamond v. Chakrabarty*, 447 U.S. 303, 315 (1980) (quoting *Marbury v. Madison*, 5 U.S. 137 (1 Cranch) (1801)); *see also Fed. Election Comm'n. v. Democratic Senatorial Campaign Comm.*, 454 U.S. 27, 31 (1981); *State of Cal. ex rel. State Water Resources Control Bd. v. Federal Energy Regulatory Comm.*, 877 F.2d 743, 745-46 (9th Cir. 1989). Particularly is this true with respect to interstate compacts. In *Texas v. New Mexico*, 462 U.S. 554 (1983), for example, the Supreme Court recognized that:

> "If there is a compact, it is a law of the United States . . . and our first and last order of business is interpreting the compact." 462 U.S. at 567-568.

There is no indication that documentary evidence not already presented with this motion, or other admissible non-documentary evidence on the issue, would be offered at trial. Kansas has presented two affidavits in

support of its argument that material issues of fact are in dispute. Colorado has moved to strike the crucial portions of these affidavits, but apart from the Special Master's ruling on that motion, these affidavits do not demonstrate material factual issues concerning the matters decided in this Report.

It is evident from the affidavit of the historian, Dr. Littlefield, that he has undertaken the same kind of examination of source documents that would ordinarily be made by a court for purposes of determining legislative or administrative intent. The events recited in Dr. Littlefield's affidavit are simply part of the historical record available to the Court for its review. The interpretation given by Dr. Littlefield to those actions are his own conclusions, not facts, drawn from the historical record, and cannot supplant the interpretation which ultimately is within the power of the Court to make. The conclusions in the Littlefield affidavit are actually more guarded than Kansas sometimes claims. Nonetheless, and even if the affidavit were to be considered, the Special Master reaches different conclusions based on his review of the historical record.

The affidavit of Carl E. Bentrup indicates that he has been a Kansas Commissioner on the Arkansas River Compact Administration since June 7, 1957. He testifies about what the "parties intended" in the 1951 Resolution, and what was "understood by all concerned." However, from the affidavit itself, it appears that his conclusions came from conversations with two of the first Commissioners. Other portions of his affidavit are factual and based on personal knowledge, but appear to relate to Colorado's allegations of laches and estoppel. Those

issues are not necessary to a resolution of Colorado's motion.

Citing Professor Moore, Kansas also asserts that summary judgment is disfavored for resolving questions of intent. Kansas' Response at 28. However, Moore clearly states that summary judgment is proper when there are no triable issues of fact and the moving party is entitled to summary judgment as a matter of law. 6 J. Moore & J. Wicker, *Moore's Federal Practice*, ¶56.17 (2d. ed. 1981). Summary judgment provides an appropriate mechanism for resolving legal questions of statutory and regulatory construction. *Standard Oil Co. v. Department of Energy*, 596 F.2d 1029, 1066 (Temp. Emer. Ct. App. 1978); *Mobil Oil Corp. v. Federal Energy Administration*, 566 F.2d 87 (Temp. Emer. Ct. App. 1977).

Finally, Kansas contends that partial summary judgment should be denied because the present case constitutes "complex litigation." Kansas' Response at 29. Kansas relies on Justice Jackson's opinion for the Court in *Kennedy v. Silas Mason Co.*, 334 U.S. 249 (1948). That decision was based, in part, on the need for "a more solid basis of findings based on litigation." 334 U.S. at 257. However, there is no indication here that the evidence at trial on the issue now decided would be different than the record now before the Special Master. Most courts have recognized that if the decision rests upon an issue of law, the fact that it is complex or poses difficult problems of interpretation or application should not stand in the way of a summary judgment motion, if there is no triable issue of fact. C. Wright, A. Miller & M. Kane, *Federal Practice and Procedure*, § 2732, at 304-307, citations omitted. Only a narrow legal issue, albeit important, has been

decided in this motion. The factual issues concerning any impact of the winter storage program on Kansas' entitlement under the Compact are reserved for trial.

Accordingly, the Special Master recommends that the Colorado Motion for Partial Summary Judgment on the 1951 Resolution be granted.

Colorado's Motion to Strike Affidavit Testimony of Douglas R. Littlefield and Carl E. Bentrup

Colorado has moved, pursuant to Rule 56, to strike Paragraphs 5-11 of the Affidavit of Douglas R. Littlefield, Ph.D., and Paragraphs 4-6 and 10 (last sentence) of the Affidavit of Carl E. Bentrup. The Special Master grants this motion.

Mr. Bentrup testifies in his affidavit as to the intent of the Compact Administration in 1951 when it adopted the 1951 Resolution. This was six years before Mr. Bentrup became a Commissioner on the Arkansas River Compact Administration. The affidavit indicates on its face that his knowledge came from conversations with two of the first Commissioners. Apart from the basic difficulty of determining the intent of a legislative or administrative body in this fashion, Mr. Bentrup's testimony is clearly based on hearsay. It is not admissible under Rule 56(e). *Friedel v. City of Madison*, 832 F.2d 965, 970 (7th Cir. 1987); *Pan-Islamic Trade Corp. v. Exxon Corp.*, 632 F.2d 539, 556 (5th Cir. 1980), *cert. denied*, 454 U.S. 927 (1981); *Maiorana v. MacDonald*, 596 F.2d 1072, 1080 (1st Cir. 1979). Even the post-enactment statements of those legislators actually involved in the enactment process have no probative weight. *Bread Political Action Committee v. Federal Election*

Commission, 455 U.S. 577, 581-84 (1982); *Petry v. Block*, 697 F.2d 1169, 1171 (D.C. Cir. 1983).

Both Dr. Littlefield and Mr. Bentrup testify as to issues of intent – of the Arkansas River Compact negotiators, of various Federal agencies, of Congress, and of the States of Kansas and Colorado. Such intent, to the extent relevant, involves interpretation of the Arkansas River Compact, the Fryingpan-Arkansas legislation, and the 1951 Resolution. The interpretation of such statutory and administrative action presents questions of law, to be decided by the Court. *Diamond v. Chakrabarty*, 447 U.S. 303, 315 (1980); *United States v. Montoya*, 827 F.2d 143, 146 (7th Cir. 1987); *Union Pacific Land Resources Corp. v. Moench Inv. Co., Ltd.*, 696 F.2d 88, 93 n. 5 (10th Cir. 1982), *cert. denied*, 460 U.S. 1085 (1983); *Texas v. New Mexico*, 462 U.S. 554, 567-68 (1983); *Petty v. Tennessee-Missouri Bridge Comm.*, 359 U.S. 275, 279 (1959).

Dr. Littlefield's testimony is based upon his review of primary historical documents, and represents his conclusions rather than factual evidence not otherwise available to the Court. Opinion testimony providing legal conclusions is not admissible. *Van Winkle & Co. v. Crowell*, 146 U.S. 42, 49 (1892); *United States v. Scop*, 846 F.2d 135, 139-42 (2d Cir. 1988); *United States v. Curtis*, 782 F.2d 583, 599 (6th Cir. 1986); *United States v. Zipkin*, 729 F.2d 384, 386-87 (6th Cir. 1984); *Owen v. Kerr-McGee Corp.*, 698 F.2d 236, 239-40 (5th Cir. 1983); *Marx & Co., Inc. v. The Diners' Club, Inc.*, 550 F.2d 505, 509-10 (2d Cir. 1977), *cert. denied*, 434 U.S. 861 (1977). In a supplemental brief, Kansas has made available the decision of the Special Master in *Nebraska v. Wyoming*, 325 U.S. 589 (1945). Tenth Memorandum of Special Master. From the material presented,

however, it appears that the affidavits involved in that decision are distinguishable from those here.

Kansas argues that the 1951 Resolution was not a legislative enactment, but rather a "bilateral agreement between two parties" that should be analyzed under contract law. Kansas' Response at 3. It is not clear that applying contract law would save either of these affidavits, but the Special Master does not agree that the 1951 Resolution represents such an agreement. It was simply a resolution adopted by the Arkansas River Compact Administration, an interstate agency, which set forth its findings of fact, comments, and recommendations to the Governors of Kansas and Colorado on the Feasibility Report for the Fryingpan-Arkansas Project. It was a policy statement by an administrative agency, not an agreement between the States of Kansas and Colorado. The Compact Administration is "a body outside the State" which has been granted, by the Compact, a "reasonable and carefully limited delegation of power." *West Virginia ex rel. Dyer v. Sims*, 341 U.S. 22, 30-31 (1951). There is no question about what the 1951 Resolution states. However, the legal right of approval over the reregulation of native waters of the Arkansas River cannot come from the Resolution. Any such authority must derive from the Compact or the authorizing legislation for the Fryingpan-Arkansas Project. The Special Master concludes that the Compact Administration was not vested with such authority.

Colorado's Motion to Stay Review of Kansas' Claim of Injury from the Winter Storage Program

Colorado's earlier motions dealt with a discrete legal issue, i.e., the authority of the Compact Administration to approve the winter storage program. Now Colorado turns to the actual impact, if any, of the winter storage program on Kansas' entitlement. Colorado moves that the Special Master not review at this time any complaint by Kansas that the operation of the winter storage program has materially depleted the waters of the Arkansas River in violation of the Compact. The ground for the motion is that Kansas has failed to make a reasonable effort to exhaust its administrative remedies with regard to any claim of injury from the operation of the winter storage program. Colorado maintains that Kansas should be required first to pursue any factual claim of injury through the Compact Administration.

It is evident that any earlier action by the Compact Administration concerning the winter storage program was at least impeded, and perhaps blocked, by the legal disagreement between the States over the 1951 Resolution. However, that legal issue having now been decided, it does not necessarily follow that the question of injury from the program should be returned to the Compact Administration for its investigation.

Colorado supports its motion with a lengthy statement of facts which it claims are not in dispute. Colorado's Motion at 3-28. According to Colorado, these "facts" show that Colorado has always supported a review of the winter storage program by the Compact Administration (*id.* at 31-32); that although Kansas

alleged injury from the winter storage program in February, 1985, its "real interest" was enforcing adherence to its interpretation of the 1951 Resolution (*id.* at 34); that by withholding the Spronk report, Kansas did not "fairly" pursue the 1985 investigation authorized by the Compact Administration (*id.* at 32-33); that on more than one occasion Kansas vetoed Administration action because Colorado would not agree on the 1951 Resolution (*id.* at 33); that various studies from 1975 to 1981 showed no reduction in inflows to the downstream John Martin Reservoir resulting from the winter storage program (*id.* at 34); and that Kansas has actually benefited, and has continued to accept those benefits, from the winter storage program. *Id.* at 34. It is sufficient to note here that these conclusions, and many of the facts stated by Colorado, are vigorously disputed by Kansas. However, a resolution of these factual issues is not required to decide this motion, and if such issues prove to be relevant, they are better decided at trial.

The parties do agree, nonetheless, that the Compact Administration decided in March, 1985, to investigate the operation of Pueblo Reservoir and the winter storage program. Colorado's Motion, Exhibit 28 at 3. Further, the record shows that both States submitted reports as part of that investigation, and that the reports reached conflicting conclusions about the effect of a winter storage program. *Id.*, Exhibit 47 at 22; *id.*, Exhibit 36 at 21. The Compact Administration, accordingly, was authorized to proceed only in other areas upon which there was mutual agreement. *Id.*, Exhibit 37 at 34-38. Under these circumstances, it appears that reasonable efforts were made

before the Compact Administration. It is also worth noting that some of the matters complained of by Colorado occurred after the Kansas complaint was filed.

Finally, the Special Master believes that a practical approach must be taken toward this motion. The Compact Administration can act only by unanimous vote of the representatives of the two States. Arkansas River Compact at Article VIII-D. It is not realistic, while this lawsuit is pending, to expect that these representatives will agree on the question of whether the winter storage program injures or benefits Kansas, or whether a Compact violation has occurred.

Colorado properly points out that the Kansas complaint does not specifically allege injury from the winter storage program. Rather, the express reference in the complaint is to Colorado's alleged unilateral rejection of the 1951 Resolution. However, the complaint does allege generally that the State of Colorado and its water users have materially depleted the usable and available stateline flows of the Arkansas River since the adoption of the Compact. Colorado acknowledges that it has been on notice since at least March, 1986, that Kansas intended to assert injury from the winter storage program. Colorado's motion at 24. The Special Master believes that the pleadings are broad enough to embrace this issue. Indeed, if the Special Master is to try the issue of whether stateline flows have been materially depleted in violation of the Compact, all possible causes should be considered. One possible cause should not be reserved to investigation by the Compact Administration, while the Special Master tries the basic issue and considers all other possible causes.

Accordingly, the Special Master denies Colorado's Motion to Stay.

DATE: September 15, 1989

/s/ Arthur L. Littleworth
Arthur L. Littleworth
Special Master

1951 Compact Administration Resolution

WHEREAS the Arkansas River Compact Administration, an official interstate body created by the Arkansas River Compact and charged with the administration of such compact, is interested in the proposed development to the extent that its construction and operation shall not interfere with the rights, interests and obligations of Colorado and Kansas under the Compact;

NOW BE IT RESOLVED by the Arkansas River Compact Administration that the following comments and recommendations relating to said report of the Secretary of Interior, to wit:

> The Arkansas River Compact Administration submits these comments and recommendations to the Governors of Colorado and Kansas respecting the proposed Initial Development, Gunnison-Arkansas Project, Roaring Fork Diversion, Colorado, namely:
>
> 1. The Administration understands that the project plan proposes:
>
>   (a) The importation by appropriate project works of approximately 70,000 acre-feet of water a year from the Colorado River Basin to the Arkansas River Basin for supplemental irrigation and domestic water supplies in Colorado and for the production of hydroelectric energy.
>
>   (b) In connection with such importation of water and its regulation in the Arkansas River Valley by project works, the re-regulation of native waters of the Arkansas River (the term 'native waters', as herein used, being those waters covered and defined by

those waters covered and defined by Art. III-B of the Arkansas River Compact).

2. The interstate water relations of Colorado and Kansas with respect to the Arkansas River do not justify any objection to the proposed project development for the importation of Colorado River water (described in sub-paragraph (a) above).

3. The re-regulation of native waters of the Arkansas River (native waters being as above mentioned) concerns the Arkansas River Compact Administration and both Colorado and Kansas in complying with the provisions of the Arkansas River Compact and maintaining the benefits and obligations of the two states under that Compact. To that end, it is recommended to the Governors of Colorado and Kansas, and expressed as a policy of the Arkansas River Compact Administration, that the Initial Development, Gunnison-Arkansas Project, Roaring Fork Diversion, Colorado, as set forth in Project Planning Report No. 7-8a. 49-1 of the Bureau of Reclamation, be approved; provided, however, that there shall be no re-regulation of native waters of the Arkansas River as proposed in such report until a plan of operation, rules, regulations, procedures and agreements in furtherance thereof, including any pertinent agreements between the Corps of Engineers and the Bureau of Reclamation, shall have been submitted to, and approved by, the Arkansas River Compact Administration and the affected water users.

4. It is the purpose and intent of these recommendations that the proposed project development shall not interfere with or defeat the rights, interests and obligations of Colorado and Kansas under the Arkansas River Compact.

be transmitted to the Governors of the States of Colorado and Kansas and such Governors be and are hereby requested to submit the same to the Secretary of Interior with their official State comments and recommendations upon said proposed project and development.

On vote being taken, the motion carried and was declared adopted.

PROOF OF SERVICE BY MAIL

STATE OF CALIFORNIA, COUNTY OF RIVERSIDE

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years and not a party to the within entitled action; my business address is Best, Best & Krieger, 400 Mission Square, 3750 University Avenue, Riverside, California 92502.

I am readily familiar with Best, Best & Krieger's practice for collecting and processing correspondence for mailing with the United States Postal Service. Under that practice, all correspondence is deposited with the United States Postal Service the same day it is collected and processed in the ordinary course of business.

On September 15, 1989, I served the within REPORT OF SPECIAL MASTER RE WINTER STORAGE PROGRAM by placing copies of the document in separate envelopes for each addressee named below and addressed to each such addressee as follows:

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On September 15, 1989, at the office of Best, Best & Krieger, 3750 University Avenue, 400 Mission Square, Riverside, California 92502, I sealed and placed each envelope for collection and deposit by Best, Best & Krieger in the United States Postal Service, following ordinary business practices.

I declare under penalty of perjury under the laws of the State of California, that the foregoing is true and correct.

Executed on September 15, 1989, at Riverside. California.

/s/ Sandra L. Simmons
Sandra L. Simmons

No. 105, ORIGINAL

In The

Supreme Court of the United States

October Term, 1985

STATE OF KANSAS,

Plaintiff,

v.

STATE OF COLORADO,

Defendant,

and

UNITED STATES OF AMERICA,

Defendant-Intervenor.

ARTHUR L. LITTLEWORTH, Special Master

REPORT – PART III

DECISION OF SPECIAL MASTER ON COLORADO'S MOTION TO DISMISS KANSAS' TRINIDAD RESERVOIR CLAIM

IN THE SUPREME COURT OF THE UNITED STATES

STATE OF KANSAS, Plaintiff, v. STATE OF COLORADO, Defendant, UNITED STATES OF AMERICA, Defendant-Intervenor.	)	No. 105 Original October Term, 1985

ARTHUR L. LITTLEWORTH, SPECIAL MASTER

DECISION OF SPECIAL MASTER ON COLORADO'S MOTION TO DISMISS KANSAS' TRINIDAD RESERVOIR CLAIM

(Filed June 9, 1992)

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IN THE SUPREME COURT OF THE UNITED STATES

STATE OF KANSAS, Plaintiff, v. STATE OF COLORADO, Defendant, UNITED STATES OF AMERICA, Defendant-Intervenor.	)	No. 105 Original October Term, 1985

DECISION OF SPECIAL MASTER ON COLORADO'S MOTION TO DISMISS KANSAS' TRINIDAD RESERVOIR CLAIM

I.

INTRODUCTION

At the conclusion of Kansas' presentation of evidence on the operation of Trinidad Reservoir, counsel for Colorado announced that it would file a motion to dismiss that portion of the Kansas claim.[1] By stipulation, the motion was filed and briefed during the recess occasioned by the illness and ultimate withdrawal of Kansas' chief technical expert.

The Colorado motion rests upon the ground that Kansas failed to demonstrate upon the facts and the law that the operation of the Trinidad Project resulted in a

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[1] Although Kansas had not rested its entire case, counsel indicated that Kansas had completed its evidence on the Trinidad Project. RT Vol. 78 at 138, 144-45 (May 16, 1991); RT Vol. 81 at 28-29 (May 21, 1991).

violation of the Arkansas River Compact. Colorado argues that Article IV-D of the Arkansas River Compact specifically allows future development in Colorado, by Federal or State agencies, including dams and reservoirs, provided that such development does not cause a material depletion in the usable flows of the Arkansas River to users in Kansas, and that Kansas failed to establish the required depletion.

The Kansas legal theory is based upon an alleged violation of Operating Principles that were approved by the Arkansas River Compact Administration for the operation of the Trinidad Project. Although Colorado does not concede that such a violation occurred, Kansas produced substantial evidence to that effect, and a violation of the Operating Principles has been assumed for purposes of this decision. It is the Kansas position that any failure to abide by the Operating Principles constitutes a Compact violation; that during the initial period of operation of Trinidad Reservoir (from 1979 to 1984) the tributary inflows from the Purgatoire River into John Martin Reservoir on the Arkansas River were substantially less in certain months than they would have been if the Operating Principles had been strictly observed; and that Kansas was entitled to 40 percent of the water thus lost to the Arkansas River.

Kansas Attorney General Robert T. Stephan, who personally made the opening statement for Kansas, said that these depletions totaled at least 20,000 acre-feet ("AF") over the 1979-84 period. RT Vol. 1 at 96 (September 17, 1990). Expert testimony for Kansas put the amount between 24,500 and 27,500 AF. RT Vol. 18 at 57 (Oct. 23, 1990); Kan. Exh. 580.

Although Trinidad Reservoir is a Federal project, the United States filed a statement that it did not intend to provide testimony or analysis during the trial on whether departure from the Operating Principles resulted in "injury" to Kansas, and accordingly, it would be "inappropriate" for the United States to take a position on whether Kansas had presented sufficient evidence to prove a Compact violation.

At the resumption of the trial on February 24, 1992, I presented my preliminary analysis and view of the motion, and requested later oral argument focusing on that analysis. Much of the day on March 10, 1992 was devoted to this argument. The parties at that time also requested an opportunity to file additional written argument and authorities. The last of these documents was filed on April 2, 1992.

The fundamental issue on which the Colorado motion turns is whether Kansas is required to show a material depletion in stateline flows caused by the operation of Trinidad Reservoir, or is required to prove only that the Operating Principles for the Project were violated, and that such violation caused less water to flow into John Martin Reservoir than would have occurred under strict compliance with the Operating Principles. Kansas did not attempt to establish that the flows of the Arkansas River at the state line were less than they would have been if the Trinidad Project had not been constructed or operated at all.

In the supplemental statements filed after oral argument, the United States raised new questions. The United States acknowledges that if a violation of the Operating

Principles is not enough to prove a Compact violation, then the Kansas claim is ripe for dismissal based upon its trial decision not to ". . . present evidence on the stateline impacts caused by the improper operations." U.S. Post-Argument Remarks at 2. But the United States goes on to ask whether a separate cause of action is available under the Compact to enforce compliance with its investigatory and administrative provisions in regard to the Trinidad Project, and if so, what allegations and proof are required. Those issues are also addressed in this decision.

II.

BACKGROUND INFORMATION

A. The Purgatoire River.

The Purgatoire River is a major tributary of the Arkansas. It flows in a northeasterly direction joining the main stem of the Arkansas at Las Animas just upstream of John Martin Reservoir. The Purgatoire originates on the eastern slopes of the Sangre de Cristo Mountains, which rise to elevations of 13,000 feet near the river's source. From this mountainous area, the river flows easterly, dropping rapidly for about 40 miles through rough and rocky terrain, and then emerging in the high plains area near the City of Trinidad. Here the elevation is about 6,000 feet. The river then flows through a wide shallow valley for about 35 miles before entering a narrow, rugged canyon for another 100 miles. This canyon gradually widens and merges with the extensive flat lands of the Arkansas Valley surrounding the City of Las Animas. Jt. Exh. 24a at 6.

Precipitation at Trinidad is on the order of 17 inches annually, and higher in the mountainous portion of the drainage basin. About 61 percent of the total precipitation at Trinidad occurs during the spring and summer months of April through August. The Purgatoire River above Trinidad is perennial, with the greatest volume of run-off being produced by melting snow during April, May and June. Thunderstorms produce floods with high peaks and these usually occur after the snow-melt season. Jt. Exh. 34 at 13-14. Flows at the Trinidad gauging station averaged 62,100 AF annually for the period 1925-1957. This study period has been considered indicative of future hydrologic conditions. Annual flows at this station ranged from 16,300 AF in 1951 to 197,300 AF in 1942. Jt. Exh. 24a at 13.

Historically, there were eleven ditch systems supplying irrigation water in the Trinidad area, with water rights priority dates ranging from 1861 to 1920. *Id.* at 11. Diversions averaged 53,200 AF per year. *Id.* at 14. A Bureau of Reclamation study found, however, that only about 37,300 AF of these diversions were actually needed to meet crop requirements. Because supplies in the area were undependable, a large part of the historic diversions were made when the water was available rather than when actually needed to meet crop growth requirements. *Id.* at 16. The Board of Engineers for Rivers and Harbors characterized the streamflow as "erratic and unseasonable for timely irrigation use"; moreover, it found that the existing storage and regulatory facilities were "inadequate for complete regulation of the available water supply for maximum crop utilization." Jt. Exh. 34 at 3.

B. History of the Trinidad Project.

The Bureau of Reclamation initiated preliminary studies to improve irrigation in the Trinidad area as early as 1937. In this same general time-frame, the Corps of Engineers was also considering the "serious and long-standing flood problem" at Trinidad. Jt. Exh. 34 at 42. The Corps at first planned to provide necessary flood protection through the construction of levies and channel improvements without any dam. However, cooperative studies conducted by the Corps and the Bureau during 1952 and 1953 led to recommendations for a reservoir project designed to meet both flood control and irrigation needs. The results of these studies were presented in a Review Report by the Corps of Engineers, June 30, 1953, printed in 1956 in House Document No. 325, 84th Congress, Second Session. Jt. Exh. 34.

House Document No. 325 includes many of the important reports and letters associated with the legislative history of the Trinidad Project. These include not only the basic 1953 Review Report of the District Engineer, but also the report and recommendations of the Chief of Engineers, the Report of the Board of Engineers for Rivers and Harbors, comments of various Federal agencies, correspondence reflecting the views of both Kansas and Colorado, and actions by the Arkansas River Compact Administration with respect to the project. *Id.*

As recommended by the District Engineer, and approved by the Chief of Engineers, the Trinidad Project called for the construction of a dam and reservoir on the Purgatoire River about four miles upstream from the City of Trinidad. *Id.* at 1, 44-46. Capacity of the proposed

reservoir was to be 140,700 AF, allocated as follows: 46,700 AF for flood control, 55,000 AF for irrigation, and 39,000 AF for sediment control. *Id.* at 28.

To obtain "maximum beneficial use of the irrigation storage," the Bureau of Reclamation suggested during this early planning phase that the project be operated according to five basic conditions:

> "(a) Transfer of the storage decree of the Model Land & Irrigation Co., for 20,000 acre-feet annually, from the present site to the proposed Trinidad Reservoir.[2]
>
> "(b) Storage in Trinidad Reservoir of flood flows originating on Purgatoire River above the dam site which would otherwise spill from John Martin Reservoir.
>
> "(c) Storage in Trinidad Reservoir of the winter flows of Purgatoire River historically diverted for winter irrigation of project lands.
>
> "(d) Regulation in Trinidad Reservoir of summer flows historically diverted to project lands provided that future streamflow records disclose such further regulation would not materially decrease depletions or that any material increase in depletions be compensated by suitable replacement to lands served by John Martin Reservoir.

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[2] Historically, the Model Reservoir of the Model Land & Irrigation Co. provided the only significant storage capacity in the area. The storage decree for the Model Reservoir was 20,000 AF, but a survey in 1946 indicated that the usable capacity of the Reservoir had been reduced to 6,200 AF because of sediment deposition and deterioration of the dam. Jt. Exh. 24b, Appendix A at 2.

> "(e) Storage in Trinidad Reservoir of all flood flows originating on Purgatoire River above the reservoir other than those specified in condition (b), provided that suitable replacement is made to John Martin Reservoir to the extent that such storage in Trinidad Reservoir would result in material depletion of the inflow from Purgatoire River into John Martin Reservoir and interfere with its operation as established by the Arkansas River compact." Jt. Exh. 34 at 4.

The District Engineer found that under the Arkansas River Compact the irrigation capacity in the reservoir could be operated in accordance with the first three of these conditions, and that such operation would not "significantly deplete the water supply presently available to water users downstream from the project area." *Id.* However, he stated that the impact of conditions (d) and (e) was "indeterminate," and recommended that the project not be operated pursuant to those conditions until their feasibility "has been demonstrated." *Id.* at 45. Moreover, he noted that operation under conditions (d) and (e) might require suitable arrangements to be made with those served from John Martin Reservoir under the terms of the Arkansas River Compact. *Id.* at 29. The Chief of Engineers and the Board of Engineers for Rivers and Harbors concurred with these recommendations, and I conclude that Congress' authorization embraced only these first three conditions. *Id.* at 1, 4-6; Jt. Exh. 35 at 309.

The District Engineer specifically recognized the Arkansas River Compact in his 1953 report, quoting from appropriate provisions, including Article IV-D, which permits upstream development in Colorado provided

". . . that the waters of the Arkansas River . . . shall not be materially depleted in usable quantity or availability for use. . . ." Jt. Exh. 34 at 21. The District Engineer concluded that operation of the project under these three basic conditions outlined by the Bureau of Reclamation, and accepted by the Corps, ". . . would not result in material depletion of the Purgatoire River inflow to John Martin Reservoir." *Id.* at 30, 43. Reference is made in the Report to specific studies which indicated that the proposed Trinidad Reservoir would deplete the usable inflow to John Martin Reservoir by an average of about 390 AF annually. *Id.* at 41.

In 1954 the Engineering Committee of the Arkansas River Compact Administration reviewed the project and determined that the depletion to John Martin would average 530 AF per year, exclusive of the years in which there would have been spills from the reservoir. Jt. Exh. 19, Oct. 26, 1954 Minutes at 15-16. Hans Kramer, Chairman of the Compact Administration, who had also chaired the Compact negotiations, said the question was whether an average annual depletion of 530 AF constituted a "material" depletion within the meaning of Article IV-D of the Compact. *Id.* at 14. In December, 1954 the Compact Administration voted not to approve the Trinidad Project "at this time." Jt. Exh. 19, Dec. 14, 1954 Minutes at 14. Chairman Kramer notified the Chief of Engineers of this action, stating that the main argument voiced against the project was concern about possible depletion of the supply to John Martin Reservoir. Jt. Exh. 34 at XVII. In General Kramer's own view, as an "engineer," such depletions would be "negligible." Jt. Exh. 19, Oct. 26, 1954 Minutes at 19.

The State of Kansas also initially opposed the project. In a letter to the Chief of Engineers, dated August 5, 1954, Governor Edward F. Arn stated:

> "Even the most conservative estimates indicate an increased depletion of Purgatoire River water. It is our conclusion that the operation of this project would, at times, materially deplete the water supply which would otherwise be available to Kansas water users through the John Martin Reservoir.
>
> "Under these conditions the State of Kansas at this time is opposed to the project as proposed." Jt. Exh. 34 at XV.

The following year, however, the State of Kansas and the Compact Administration both conditionally reversed their positions. Kansas Governor Fred Hall wrote to the Chief of Engineers as follows:

> "This matter subsequently has been given further consideration by both the State of Kansas and the Arkansas River Compact Administration. It is recognized that there is a serious flood-control problem at Trinidad and an urgent need for measures to deal with it. The problems remaining to be resolved with respect to the proposed reservoir project pertain to the effect that its operation would have on water supplies which otherwise would be available for storage in the John Martin Reservoir and for use in Colorado and Kansas under the terms of their compact.
>
> "At their meeting on July 12, 1955, the Arkansas River Compact Administration adopted the following motion:

> 'That the Arkansas River Compact Administration approves the flood-control project on the Purgatoire River subject to an operating procedure to be approved by the affected water users in Colorado and Kansas, the State of Kansas and the administration.'
>
> "I concur in the action taken by the administration and hereby modify the position of the State of Kansas with respect to the proposed Purgatoire River project to conform to the views of the Arkansas River Compact Administration, as expressed in the motion quoted above." Jt. Exh. 34 at XVI.

The Trinidad Project was authorized by the 85th Congress under Public Law 85-500, enacted on July 3, 1958. The authorizing language is part of an omnibus act and consists of only a single sentence in the lengthy act that provides for the construction and preservation of a large number of public works throughout the country. The brief provision on the Trinidad Project reads:

> "The project for the Trinidad Dam on Purgatoire River, Colorado, is hereby authorized substantially in accordance with the recommendations of the Chief of Engineers in House Document Numbered 325, Eighty-fourth Congress, at an estimated cost of $16,628,000." Jt. Exh. 35 at 309.

It is significant that the Congressional authorization did not make the project subject to an "operating procedure" to be approved by the State of Kansas and the Compact Administration, as conditioned in the Compact Administration's approval action. Congressional approval was based only upon the Chief of Engineer's

report. The "Operating Principles" on which the present Kansas claim rests were not adopted until 1967.

C. The 1961-1964 Operation Studies.

After the Trinidad Project was authorized in 1958, Congress appropriated funds for further planning studies to be conducted by the Bureau of Reclamation, but limited to the irrigation function of the project. Jt. Exh. 24a at 1-2. The studies were to "firm up" the findings of the 1953 Review Report of the District Engineer. Jt. Exh. 24b, Appendix A at 1. These studies were based upon the following reservoir space allocations: 51,000 AF for flood control, 20,000 AF for irrigation, 39,000 AF for joint use (i.e., for irrigation and sediment accumulations), and 4,500 AF for fish and recreation. Jt. Exh. 24a at 2. The total capacity of the reservoir was thus reduced from the 140,700 AF submitted to Congress to 114,500 AF. Allocations for the various functions were also modified. Flood control capacity was slightly increased, fish and recreation capacity was added, while the allocation for storage of irrigation water was substantially cut.

The initial Bureau studies, completed in 1961, assumed an equal sharing of the project water supply among the various irrigation ditches. Jt. Exh. 24b, Supplement to Appendix A at 1. This concept proved unacceptable to the local Purgatoire River Water Conservancy District. The District maintained that the study should be modified to take into account senior water rights, including the Model Land and Irrigation Company, which was providing the storage right. *Id.* This was done, and revised operations studies were completed in 1964,

including the development of detailed Operating Principles and Criteria. Jt. Exh. 24a.

The Bureau's 1961-64 studies recognized the prohibition in the Arkansas River Compact against a material stateline depletion but, subject to that limitation, stated that the conservation capacity of the reservoir would be used to regulate the flows of the Purgatoire River ". . . for maximum beneficial use of crops grown within the project area." Jt. Exh. 24b, Appendix A at 5. The water supply analysis in these studies was based upon a 33-year period, 1925-57, which was judged to be indicative of future conditions. Jt. Exh. 24a at 13. The project area consisted of 19,717 acres of irrigable land to be served by the eleven existing ditch systems. *Id.* at 2. The acreage limit of 19,717 acres called for the retirement of 5,975 acres of poor quality Class 6W lands, and the transfer of their water rights to 6,543 acres of idle, but more productive, irrigable lands. *Id.* at 2-4. Project diversions were to be limited to actual requirements (the so-called "ideal crop requirements") for the 19,717 acres of irrigable lands. *Id.* at 17; Jt. Exh. 24b, Appendix A at 7; RT Vol. 19 at 12-14 (Oct. 24, 1990). Operation of the project was expected to provide an additional effective crop irrigation supply averaging 6,760 AF annually. This improvement was expected to increase the average effective headgate irrigation supply from 61% of ideal requirements to 81.9%, and the crop supply from 74% of consumptive use requirements to 89%. Jt. Exh. 24b, Appendix A at 8; Supplement to Appendix A at 7.

As proposed in the original 1953 Review Report of the District Engineer, the 1961-64 studies assumed that

the 20,000 acre-foot storage decree for the Model reservoir would be transferred to Trinidad Reservoir, even though the existing capacity of the Model reservoir was on the order of only 6,200 AF. Jt. Exh. 24a at 2, 8; Jt. Exh. 24b, Appendix A at 2. Winter flows historically diverted for winter irrigation would also be stored. Jt. Exh. 24a, Appendix A at 2. Storage of winter water, however, was to be under the Model storage decree, and charged against that right. Jt. Exh. 24b, Appendix A at 6; Jt. Exh. 23 at 2, 11.

Based upon these operating conditions, it was assumed in both the 1961 and the revised 1964 studies that the Trinidad Project could be accomplished ". . . under the provisions of Colorado law and the Arkansas River Compact without adverse effect on downstream water users and the inflow to John Martin Reservoir." Jt. Exh. 24b, Appendix A at 7, 71. The 1964 study actually predicted a slight average increase of 400 AF annually in the inflow to John Martin as a result of the project. Jt. Exh. 24a at 22 (Table 8). This increase in downstream flow was expected to occur from more stable return flows, a decrease in channel losses during flood periods, and a small reduction in John Martin spills. *Id.* at 21.

III.

THE OPERATING PRINCIPLES

A. Approval of the Operating Principles.

As part of the 1964 studies, proposed Operating Principles were developed and included as Appendix A to

that report.[3] Jt. Exh. 24a. The Operating Principles were submitted for review and tentatively approved by the Corps of Engineers, the Colorado Water Conservation Board, and the Purgatoire River Water Conservancy District. *Id.* at 23. In addition, the proposed Operating Principles were reviewed by the Kansas members of the Compact Administration and the Kansas Water Resources Board. *Id.*; Jt. Exh. 42.

On December 30, 1966, Governor William H. Avery of Kansas wrote to H. P. Dugan, Director of Region 7 of the Bureau of Reclamation, stating that the report on the Trinidad Project had been considered by various Kansas agencies and users, and acknowledging that the Bureau of Reclamation had also provided additional information on the effects of the proposed project on downstream water supplies. On the basis of this information, he stated:

> ". . . [T]he Water Resources Board advises that in its judgment, the proposed Trinidad Project will not materially add to the depletion of the water supply of the Purgatoire River and to John Martin Reservoir providing that the project is operated in strict conformity with the guidelines used in the investigation and with the operating principles amended to incorporate the following conditions. . . ." Jt. Exh. 42.

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[3] The report also included certain "Operating Criteria" for the Purgatoire River Water Conservancy District. These criteria included more detailed provisions for the operation of the Trinidad Project, but were not submitted to the Compact Administration for approval. They are, nonetheless, incorporated into the repayment contract between the Purgatoire District and the Bureau of Reclamation. Jt. Exh. 39, Exhibit B.

Governor Avery then set forth five Kansas conditions, of which numbers 2, 3 and 4 may be relevant to the present issues:

> "1. All inflows over established Colorado water rights (1156.05 cfs) be designated flood flows and released as promptly as downstream conditions permit. The only time water so designated may be stored in the conservation pool will be when John Martin Reservoir does not have the capacity to store additional water.
>
> "2. Any subsequent amendment of the operating principles should be subject to review and approval of the same interests as provided for in the original procedure.
>
> "3. Assurances that there will be no significant increase in water use which would result in a depletion of water yield to other Colorado and Kansas water users.
>
> "4. That 5 years after beginning operation of the Trinidad Reservoir for irrigation purposes, the operating principles be reviewed to determine the effect, if any, the operation has had on other Colorado and Kansas water users and the principles amended as necessary. Each 10 years thereafter reviews should be provided with amendments as needed.
>
> "5. All operating records be open for inspection by any qualified representative of the Arkansas River Compact Administration." Jt. Exh. 42.

If the five Kansas conditions were accepted by the Bureau of Reclamation and the Purgatoire River Water Conservancy District, Governor Avery wrote that Kansas

would be in a position to approve the amended Operating Principles and to support completion of the project. *Id.*

On January 26, 1967, the Purgatoire District adopted a resolution approving the five conditions proposed by Kansas, having found that they were "consistent with the manner of operation of said project as contemplated by this Board." Jt. Exh. 43. By letter dated February 1, 1967, the Regional Director of the Bureau of Reclamation advised Governor Docking of Kansas that the Bureau concurred in the resolution adopted by the Purgatoire River Water Conservancy District, ". . . and will be governed accordingly in implementing the 'Operating Principles.' " Jt. Exh. 44. In a separate letter to John M. Dewey, Kansas Water Resources Board, the Bureau confirmed its "commitment" to Kansas that the Trinidad Project would be operated "strictly in accordance with the 'Operating Principles' " as amended by the five Kansas conditions. Jt. Exh. 23, Appendix IV.

On March 20, 1967, at the suggestion of the Kansas Water Resources Board, the Bureau's Regional Director sent Governor Docking a letter setting forth the Operating Principles and the five Kansas conditions in one document. Jt. Exh. 46. Governor Docking responded to the Bureau, signifying his approval of the amended Operating Principles, and stating that Kansas would offer no objection to completion of the Trinidad Project ". . . subject to the acceptance of the amended principles by the Arkansas River Compact Administration." Jt. Exh. 45.

The Operating Principles had been included as part of the repayment contract between the United States and

the Purgatoire River Water Conservancy District for the reimbursable costs of the Trinidad Project. Jt. Exh. 39. The contract provides, in part, that the regulation, storage and release of the waters of the Purgatoire River will be subject to the Operating Principles. *Id.* at 4, 14.

Against this background, the Trinidad Project and the Operating Principles came before the Compact Administration at its meeting on June 6, 1967. In attendance were representatives of the Corps of Engineers, Bureau of Reclamation, United States Geological Survey, Purgatoire River Water Conservancy District, and several of the downstream Arkansas Valley ditch companies. The discussion, as reflected in the minutes, was relatively brief and centered on the relationship between the five Kansas conditions and the original draft of the Operating Principles.

In particular, the question was whether the five-year review required under the Kansas conditions would prevail over the ten-year review provided in Part F of the original Operating Principles. Mr. Ogilvie, the representative of the Bureau of Reclamation, said that it would. Jt. Exh. 19, June 6, 1967 Minutes at 6. More generally, a Colorado member of the Compact Administration assured the meeting that any amendments such as the Kansas conditions would supersede the original document. *Id.* The Colorado member then moved that the Operating Principles be approved ". . . with the understanding that the amendments take precedent [sic] over the original operating principles as presented." *Id.* The Kansas members thought that it would be "less clumsy" to redraw the principles and incorporate the amendments into a single document. After a recess, the Colorado

member withdrew his original motion with the following substitute action:

> "Moved that the document of March 20, 1967 submitted to Governor Docking and signed by H. P. Dugan and counter-signed by Dr. Donnelly be approved by the Arkansas River Compact Administration. Mr. Green seconded the motion and after some discussion the motion was carried by vote of the states. The documents are attached as Appendix A." *Id.* at 7.

This letter from Bureau of Reclamation Director Dugan, which was the subject of the Compact Administration action, expressly recognized the desirability of including the Operating Principles and the five Kansas conditions "clearly in one document so as to avoid any misunderstanding," and he did so in that letter by adding the five Kansas conditions to the end of the Operating Principles. Jt. Exh. 46.

In the briefs of counsel, there is considerable argument over the nature of the action taken by the Compact Administration, that is, whether such action constitutes a binding Compact rule or regulation, procedure, or action to implement the Compact, or whether it is only a finding that becomes prima facie evidence, or whether it is none of these. The minutes themselves do not specifically characterize the nature of action in any way that assists in this inquiry.

B. Operation of the Trinidad Project, 1979-84.

Construction of Trinidad Reservoir was completed and it was ready to impound water on January 1, 1977. Jt.

Exh. 23 at 4. However, litigation within Colorado delayed any substantial storage until March, 1979. Since May of 1979, most of the project irrigation canals have been delivering water regulated by Trinidad Reservoir. *Id.*

During the 1979-84 period, Colorado's Division 2 Engineer permitted the Purgatoire River Water Conservancy District to make an accounting transfer of any water stored under the Model right that remained in storage at the end of the water year into the "joint-use pool." Jt. Exh. 23 at 9-11. This was the 39,000 AF of capacity assigned to "irrigation and sediment accumulation," and was in addition to the 20,000 AF allocated solely to "irrigation." *Id.*, Appendix I at 2. This practice is known as "rollover," and permitted storage, during the subsequent year, of any part of the full 20,000 AF Model right that was not stored in the previous year. The Division 2 Engineer also permitted the Purgatoire District to store winter inflow to Trinidad Reservoir during the non-irrigation season under the direct flow priorities of the project ditches, and did not account for such storage against the Model storage decree. Jt. Exh. 23 at 11. The Kansas complaint does not specifically refer to such storage of winter water, but evidence on the alleged violation was introduced by Kansas without objection from Colorado or the United States. I therefore treat the winter water storage issue as a part of the present motion.

In its 1988 report, the Bureau of Reclamation stated that these two practices (rollover and winter water storage) were contrary to the assumptions underlying the 1961-64 studies. The Bureau stated:

> "These operation studies [the 1961-64 studies] were based on the assumption that any water remaining under the Model right would be included in the following year's entitlement to storage and that the winter storage would be stored under the Model right. The studies concluded that the Project would not, on an average annual basis, cause additional depletion to the inflow to John Martin Reservoir." Jt. Exh. 23 at 11; RT Vol. 18 at 68 (Oct. 23, 1990).

From a review of House Document No. 325, and the 1961-64 studies, the Bureau said there is "little doubt" that the Bureau personnel formulating the irrigation components of the project "did not intend that water stored under the Model right be transferred out of the Model Right or that winter water be stored under any right but the Model right." Jt. Exh. 23 at 11.

The Bureau of Reclamation concluded in its 1988 report that the practices of rollover and winter water storage outside of the Model decree constituted a "departure from the intent of the operating principles." *Id.*

Kansas complained immediately about the way Trinidad Reservoir was being operated. A special meeting of the Compact Administration was called by Kansas officials on June 30, 1980. Kansas representatives stated that the joint use capacity account had been illegally used; that such capacity was to be used only for sedimentation, the purchase of additional downstream rights, and the capture of available water in priority if John Martin Reservoir were spilling. Jt. Exh. 19, June 30, 1980 Minutes at 3.

Carl Bentrup, one of the Kansas representatives to the Compact Administration, who was the only member who had participated in the Administration's 1967 decision, explained that the intent of the Operating Principles, as approved by the Administration in 1967, was that no more than 20,000 AF of water would ever be stored behind Trinidad Dam, unless John Martin were overflowing or additional downstream water rights were purchased. *Id.* The Compact Administration found that in October, 1979 the Purgatoire River Water Conservancy District had transferred 18,290 AF stored under the Model reservoir right into the joint use pool, and in the following year, when the Model storage right came into priority, 20,000 AF of additional water were stored. *Id.* at 7-8; RT Vol. 17 at 100-101 (Oct. 22, 1990).

On the basis of the Kansas charges, the Compact Administration authorized an investigation of the Trinidad Project, but the issues could not be resolved at the Compact Administration level.[4] Jt. Exh. 19, June 30, 1980 minutes at 7-8. Finally, in December, 1984, the Compact Administration asked the Bureau of Reclamation to conduct a review of Trinidad Reservoir operations with the participation of both States and other interested parties. Jt. Exh. 19, Dec. 11, 1984 Minutes at 10; RT Vol. 17 at 105 (Oct. 22, 1990). This request also coincided with Kansas' Condition 4, which called for a five-year review. The

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[4] See Decision of Special Master on Colorado Motion to Stay, October 21, 1988, for some of the Administration history during this period of time. Kansas continued after 1980 to register complaints about the Trinidad operations. Jt. Exh. 23 at 4.

results of the Bureau's study are found in a report entitled "Review of Operating Principles," dated December 1988 and admitted into evidence as Joint Exhibit 23.

C. Bureau of Reclamation Review of Trinidad Project Operations, 1979-84.

In performing its review of 1979-84 project operations, the Bureau of Reclamation first developed a computer model to reconstruct its 1961 report. Jt. Exh. 23 at 12. The model and input data were then modified to fit the parameters of the 1964 study. *Id.* The computer-based reconstruction of the 1964 study became the Bureau's "baseline" study, denominated "1H." *Id.* It simulates operation of the Trinidad Project over the 1925-57 period, in strict conformity with the Operating Principles. *Id.* at 17; RT Vol. 18 at 24 (Oct. 23, 1990). Study "5H" also simulates operation of the Trinidad Project over the 1925-57 period, but alters the baseline criteria to assume the practice of rollover and the storage of winter water without charging such storage against the Model right. Jt. Exh. 23 at 17-18; RT Vol. 18 at 24, 27 (Oct. 23, 1990).

The Bureau compared both of these simulations against a "without project" condition, that is, the storage of only 6,000 AF under the historic Model storage decree. Jt. Exh. 23 at 17. The results of these comparisons are set forth in Table 5 of Jt. Exh. 23 at 21-22. Assuming that the Trinidad Project was in operation during the 1925-57 period under conditions of the 1964 study (i.e., no rollover and no winter water storage outside of the Model right), Study 1H shows that the inflow to John Martin would have increased by an average of 1,000 AF per year.

Jt. Exh. 23 at 21, Table 5. Assuming the practice of roll-over and the storage of winter water, the estimated inflow to John Martin Reservoir becomes less, but it still shows an average increase of 300 AF annually. *Id.* It is interesting to note that this 1988 computerized simulation demonstrates the same slight increase of inflow into John Martin as the 1961 study, although the 1988 results assumed a violation of the Operating Principles, whereas the 1961 study assumed strict compliance. *Id.*, Table 5, 1961 column.

The 1988 Bureau Report includes numerous other comparison "runs," as they are sometimes called. Each of these additional computer simulations varies certain of the assumptions used. For example, both the baseline 1H study and run 5H assumed that the storage capacity of the joint use pool was 19,500 AF. This figure represents the average capacity available over the life of the project, assuming some gradual filling through sedimentation, and it is the same capacity that was utilized in the Bureau's 1961-64 studies. RT Vol. 18 at 31-32 (Oct. 23, 1990); Jt. Exh. 23 at 7. However, while run 5H39 uses operational criteria similar to run 5H, it assumes that the capacity of the joint use pool is 39,000 AF, rather than 19,500. Under run 5H39, therefore, the full capacity of the joint use pool is deemed to continue to be available, without reduction due to sedimentation. While this assumption seems unrealistic, use of the larger storage capacity nevertheless causes an average reduction of inflow to John Martin Reservoir of only 100 AF annually. Jt. Exh. 23 at 21, Table 5.

The full array of the different comparison studies and assumptions is described on pages 17-20 of Joint Exhibit

23, with the results shown on Tables 5, 6, 8 and 9. The Bureau concluded that "under most of the practices and conditions studied," the inflow to John Martin Reservoir would be larger than that which would have occurred without the project. Jt. Exh. 23 at 28-29. These various studies of the 1925-57 period, according to the Bureau, ". . . provide a sound basis for assessing future impacts and evaluating proposed amendments." *Id.* at 28. The Bureau's overall conclusion on the future impact of the practice of rollover and storage of winter flows is stated as follows:

> "The transfer of water from the Model Right and the storage of winter water under the direct flow decrees, either singularly or collectively, *will not cause the future usable inflow to John Martin Reservoir to be less with Trinidad Project in operation than it would have been without the Project.* These practices will, however, result in less inflow to John Martin Reservoir than would occur if the water rights were administered in accordance with the intent of the Operating Principles." Jt. Exh. 23 at 55. (Emphasis added.)

Turning to the Kansas assessment of these various studies, Brent E. Spronk, Kansas' expert witness on this subject, testified that the Bureau's Study 5H39NOWBP best contrasts the actual operation of the Trinidad Project (i.e., including rollover and winter storage) with historical conditions. RT Vol. 20 at 66, 68-69 (Oct. 25, 1990); Jt. Exh. 23 at 20. Spronk acknowledged that whether this run would best indicate future impacts would depend upon how fast the sediment portion of the reservoir fills and the outcome of a legal dispute affecting certain winter bypasses. RT Vol. 20 at 69-70 (Oct. 25, 1990). Even so, this

study shows that the average inflow to John Martin Reservoir would be reduced by virtue of the Trinidad Project by only 200 AF per year. Jt. Exh. 23 at 22, Table 5. Given the study assumptions as well as the results, I do not believe that it demonstrates a material depletion within the meaning of the Arkansas River Compact.

The Bureau's 1988 Report also includes three case studies for the years 1979 through 1984 during which the Trinidad Project was in actual operation. The Bureau found that during this period of time, the practice of rollover and the failure to charge winter storage against the Model decree resulted in net additional water storage in Trinidad Reservoir of 23,855 AF. Jt. Exh. 23 at 12. This is not to say, however, that the inflow to John Martin Reservoir was reduced by an equivalent amount. The three case studies were undertaken to determine that impact on John Martin. *Id.* For the initial 1979-84 period, they were an effort to compare what was expected to occur, under the 1961-64 studies, with what actually happened. RT Vol. 17 at 117-18 (Oct. 22, 1990).

In each of the three cases, the Bureau simulated project operations in strict compliance with the Operating Principles, that is, without transfer of storage under the Model Right into the joint use pool, and without storage of winter water outside of the Model Right. Jt. Exh. 23, Appendix II at 26. In both Case 1 and Case 2, the Bureau assumed irrigation of the full project area of 19,717 acres, and used the 1961 study criteria to determine the headgate diversions and return flows from such irrigation. Thus, diversions were not actually measured but rather were calculated upon the "ideal irrigation requirement"

for all of the project lands. RT Vol. 17 at 115 (Oct. 22, 1990).

The actual diversions during the 1979-84 period exceeded these "ideal" requirements, which called for increased irrigation efficiencies in order to minimize impacts on downstream users. Jt. Exh. 24a at 17; Jt. Exh. 24b, Appendix A at 7; Jt. Exh. 23 at 42-44; RT Vol. 18 at 36-37 (Oct. 23, 1990). While these studies assumed that the 19,717 acres of project lands were irrigated, this also was not true in fact. Because it was necessary to rehabilitate some of the distribution systems, a "substantial part" of the project lands was not irrigated during the early years. Jt. Exh. 23 at 4, 25, 28. At the same time, some of the Class 6W lands that were to have been retired did receive water, although the Bureau concluded this use had no impact on downstream users. *Id.* at 55. Under Case 3, the Bureau simply used the actual amount of irrigation diversions during the study period. *Id.*, Appendix II at 26.

The results of the three case studies are shown on Table 4 at page 16 of Joint Exhibit 23. Case 1 shows a net increase in the flows into John Martin of 3,500 AF over the study period of 1979-84 by virtue of the Trinidad operations. Case 2 shows a net decrease of 3,600 AF. Finally, Case 3 shows a net decrease of 11,600 AF.

The Bureau states that Case 3 ". . . best represents the actual impacts resulting from the departures from the intent of the Operating Principles." Jt. Exh. 23 at 25. Yet from the standpoint of "injury to downstream users," the Bureau concludes that Case 1 gives the "most reasonable results." *Id.* at 26. The most significant Bureau conclusion

is that none of these three case studies predicts future impacts:

> "The studies run on the operation during the 1979-84 review period *do not* provide a sound basis for assessing the future impacts that would be caused by transfer of water out of the Model Right and storage of winter water under the direct flow rights. These studies are also not useful for evaluating proposed amendments to the Operating Principles because the full project acreage was not irrigated during the review period, these studies are not representative of expected future conditions. Since the studies on the review period do not compare actual operation to a 'without project' condition, they cannot be used to determine what, if any, injury the Project may have on downstream water users." Jt. Exh. 23 at 28. (Emphasis in original.)

The Bureau states that sufficient information was not available to make a "without project" comparison for the 1979-84 period.

> "However, none of the three studies gives a true picture of injury because they do not compare the actual condition to a 'without project' condition. We investigated making the 'without project' comparison and concluded that there was not sufficient information available to make meaningful comparisons." *Id.* at 26.

The Bureau does acknowledge, however, that the practice of rollover and the storage of winter water outside of the Model right during the 1979-84 review period ". . . has depleted the *usable* inflow to John Martin Reservoir when compared to the inflow that would have occurred had the Trinidad Project been in accordance

with the intent of the Operating Principles." *Id.* at 55. (Emphasis in original.)

Finally, the Bureau recommended that the transfer of water from the Model storage right, and the storage of winter flows, be discontinued until such time as the Operating Principles are amended to recognize these practices. *Id.* at 57. Dr. Jeris Danielson, Colorado State Engineer, turned this recommendation into a directive. On April 27, 1989 he wrote to the Purgatoire River Water Conservancy District, stating in part:

> "I have been advised by legal counsel for the State of Colorado that the Bureau of Reclamation's new interpretation of the Operating Principles is likely to be viewed as persuasive with regard to these practices. Therefore, although the Operating Principles do not explicitly adopt the criteria used in the operation studies performed by the Bureau of Reclamation, I have been advised that until such time as the Operating Principles are amended or a court of competent jurisdiction determines that these practices are not a departure from the intent of the Operating Principles, I should administer the Project water rights consistent with the Bureau of Reclamation's most recent interpretation of the Operating Principles." Jt. Exh. 52.

He concluded by directing that, effective November 1, 1988, Trinidad Reservoir would be administered without rollover or storage of winter water outside of the Model right. *Id.*

It appears that this directive is currently being followed, although a state action has been filed to amend relevant water rights decrees.[5]

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[5] In the summer of 1990, shortly before commencement of this trial, Kansas filed a Petition for Writ of Prohibition asking the Supreme Court to restrain Case No. 88CW21 in the Colorado District Court, Water Division No. 2. That case had been brought by the Purgatoire River Water Conservancy District and involved the Operating Principles for the Trinidad Project. On September 17, 1990, an affidavit by M.E. MacDougall, the Purgatoire District's attorney, was filed in the prohibition proceeding in response to my request for information concerning the nature of the state court suit. In his affidavit Mr. MacDougall represents that the purpose of the suit is to obtain modification of the state court decree which authorized moving the location of the Model storage right to the Trinidad Project. That decree was entered on April 15, 1965 in Civil Action No. 19793 in the District Court for Las Animas County. (Certain later decrees are also pertinent. See *Purgatoire River Water Conservancy Dist. v. Kuiper*, 197 Colo. 200, 204-205, 211, 593 P.2d 333.) The 1965 decree had provided that storage at the new location would be conducted in accordance with House Document No. 325 "as implemented" by the Operating Principles. Mr. MacDougall concedes that the state court does not have jurisdiction to amend the Operating Principles; it appears that adjustment of the state court decrees is being sought in case the Operating Principles are amended.

On the first day of trial herein, Kansas withdrew its request for prohibition, and the Conservancy District since then has tried to have Case No. 88CW21 set for trial. However, other parties have objected on the basis of the pendency of this Supreme Court litigation. The latest information received on this subject is a May 8, 1992 letter from the Clerk of the Water Court stating that Case No. 88CW21 "is presently on a 'hold' status until a ruling is made in *Kansas v. Colorado*."

IV.

ANALYSIS AND DISPOSITION OF THE ISSUES

A. The Kansas Legal Theory.

The legal theory now being advanced by Kansas in support of its Trinidad claim is not apparent from the face of the complaint. The Kansas complaint centers around the allegation that Colorado and its water users ". . . have materially depleted the usable and available stateline flows of the Arkansas River" in violation of the Arkansas River Compact. Complaint, para. 7. Paragraphs 8 through 10 of the complaint specify certain actions which have caused or have allowed the material depletions to occur. The only direct mention of the Trinidad Project comes in Paragraph 12, where it is listed among several "alleged Compact violations" which the Compact Administration undertook to investigate in 1985, pursuant to Article VIII-H of the Compact. The specific reference is to "Colorado's artificially transferring water from the storage pool in Trinidad Reservoir to the sediment pool and then refilling the storage pool to the detriment of downstream users."

The brief filed by Kansas in the Supreme Court in support of its motion to have the court exercise its original jurisdiction carries a more general reference to the Trinidad Project, but still links the Trinidad issues to a material depletion in river flows. Kansas states there that the 1985 investigation by the Compact Administration was to determine whether ". . . the operation of the Trinidad dam and reservoir project," among other actions in Colorado, caused a material depletion in the waters of the Arkansas River. Kansas Brief at 4. No mention of the Operating Principles for the Trinidad Project appears in

the Complaint or any of the accompanying documents. Nor is there any suggestion that a claim or cause of action is being pursued based upon a violation of the Operating Principles only.

During the trial, however, Kansas presented quite a different legal concept in support of its Trinidad claim. The Kansas trial presentation rested upon a showing that the Operating Principles were violated, and the assertion that such violation *per se* constituted a Compact violation.[6] Kansas Supplemental Statement at 17. Kansas attempted to sever its Trinidad claim from any need to show injury or a material depletion in the usable flows of the Arkansas River available to Kansas. During oral argument, counsel for Kansas summarized the point:

> "Kansas believes that the Operating Principles are binding on both parties, that a departure from the Operating Principles is a violation of the Compact, regardless of injury. The test is not whether there has been a material depletion, but rather whether there has been a departure from the Operating Principles." RT Vol. 94 at 19, 38-39 (March 10, 1992).

It is the position of Kansas that the Operating Principles were properly adopted by the Compact Administration under authority of Article VIII-B of the Compact, and

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[6] This opinion does not address the possible question of whether Kansas has a claim for violation of the Operating Principles that is independent of the Compact, that is, a cause of action based upon a separate agreement with Colorado, or as a third party beneficiary under the repayment contract, or otherwise.

accordingly are binding upon the State of Colorado. Kansas Brief in Opposition to Colorado's Motion at 4-5, 10, 28; RT Vol. 94 at 26-27 (March 10, 1992). Any departure from the Operating Principles, according to Kansas, ". . . is therefore a violation of the Compact." Kansas Brief in Opposition to Colorado's Motion at 28. Depletions from such "Compact" violations were quantified by comparing the flows into John Martin Reservoir "as they would have occurred under the Operating Principles with the flows that occurred under actual operations." *Id.*

Under the evidence in this case, such a measure of damages would afford Kansas significant benefits from the project, as opposed to merely protecting Kansas and other downstream users against material depletions. Kansas asserts that a without-project analysis, that is, comparing the flows actually received with those that would have occurred in the absence of the project, is not appropriate or consistent with applicable law. *Id.* at 18.

B. The Kansas Testimony and Evidence.

Much of the Trinidad evidence was documentary, introduced by both States in the form of joint exhibits. These exhibits include the legislative history of the project in Congress, the Bureau's 1961-64 studies, development and approval of the Operating Principles and the five Kansas conditions, consideration of the project by Kansas and the Compact Administration, and the Bureau's review of the initial project operations from 1979 through 1984. Kansas also offered the testimony of Brent E. Spronk, one of its chief expert witnesses.

Spronk quantified the depletions of inflow into John Martin Reservoir, according to the Kansas legal theory. That is, using the Bureau's Case 1 and Case 3 Studies with certain adjustments, he calculated monthly depletions of the inflow to John Martin Reservoir, based upon the differences between actual inflows during 1979-84 and those that would have occurred under strict compliance with the Operating Principles. In making this analysis Spronk looked only at the months in which depletions occurred, and then totaled the amounts of such depletions. RT Vol. 17 at 133-36, 139-40 (Oct. 22, 1990); RT Vol. 18 at 62 (Oct. 23, 1990). He deliberately chose not to offset those depletions by the many months during which the Trinidad Project increased inflows into John Martin.

On this basis, Spronk concluded that during the 1979-84 period the total additional inflow into John Martin Reservoir, under strict compliance with the Operating Principles, would have been between 24,500 AF and 27,500 AF. RT Vol. 18 at 57 (Oct. 23, 1990); Kan. Exh. 580. In accordance with the allocation formula the parties now use (the 1980 Resolution), Kansas would have been entitled to 40% of this additional storage. RT Vol. 18 at 71, 117-18 (Oct. 23, 1990).

Spronk's testimony reflects the Kansas legal position that the Operating Principles have to be complied with each month, without considering averages. RT Vol. 17 at 139-40 (Oct. 22, 1990). According to this view, a violation of the Operating Principles is not to be offset by additional flows provided at some other time. The result, of course, is to allot to Kansas more water than it would

have received if the Trinidad Project had not been constructed.

On cross-examination, Spronk acknowledged that his analysis would not be appropriate if the Trinidad operations were looked at in terms of injury to Kansas, instead of merely considering the reductions caused by the practices of rollover and winter storage. RT Vol. 18 at 72 (Oct. 23, 1990). In that event, he agreed, the storage available in John Martin Reservoir would have to be taken into account. He testified:

> "In terms of injury, I think you would have to look at whether the shortages of water that were made to the inflow of John Martin caused at any time a reduction in the quantity of water available to Kansas water users at the time that they demanded or needed water. In that light, if the Kansas account at that time did not go to zero and replacement for some previous depletion had been made – in other words, there is an increase in a month – in terms of injury, the injury may in fact be mitigated by the accretions that occur after depletion occurred; or visa versa if there is accretion before the depletion, that would prevent injury so long as the magnitudes are the same and so long as the amounts of water that are available are there when Kansas would have otherwise needed it and called for it." *Id.*

Kansas presented no specific evidence that coupled the depletions and accretions from project operations to the water stored in John Martin Reservoir, or to any injury to Kansas. Nor did Spronk make a without-project analysis. That is, he did not compare the actual inflows into John Martin Reservoir for the 1979-84 period of

operations with flows that would have occurred if the Trinidad Project had not been built. *Id.* at 74. He testified that such study was not necessary ". . . to determine whether depletions had occurred as a result of the departure from the Operating Principles." *Id.* However, he added that it would be difficult to make an accurate without-project analysis for 1979-84 because of uncertainty in estimating diversions in the absence of the project. RT Vol. 19 at 11, 14 (Oct. 24, 1990). In the final analysis, however, Kansas offered no evidence, apart from the Bureau studies, to show that the actual operation of the Trinidad project caused it to receive less water than under historical, without-project conditions. As already noted, the Bureau had concluded that the practices of rollover and storage of winter water would not cause ". . . the future usable inflow to John Martin Reservoir to be less with the Trinidad Project in operation than it would have been without the Project." Jt. Exh. 23 at 55.

C. The Nature of the Compact Administration's Action in Approving the Operating Principles.

Kansas' Trinidad claim rests upon establishing three propositions: first, that the action of the Compact Administration in approving the Operating Principles was a proper exercise of authority under Article VIII-B of the Compact and is therefore binding upon Colorado; second, that the Operating Principles are enforceable apart from showing a material depletion in usable river flows available to Kansas; and third, that injury from a violation of the Operating Principles may be established by considering only months in which depletions resulted,

without taking into account offsetting accretions in other months. It is open to question whether Kansas held the same legal theories when the complaint was framed in 1985, but nonetheless, the Trinidad issues were tried on this basis.

The Compact Administration is specifically given power to adopt by-laws, rules and regulations consistent with the Compact; to prescribe procedures for the administration of the Compact; and to perform all functions required to implement the Compact. Article VIII-B(1)(2)(3). Kansas argues that the action of the Compact Administration taken on June 6, 1967 comes within this Article, emphasizing primarily that the Administration's approval of the Operating Principles effectively makes them valid rules and regulations with the same binding force as the Compact. Kansas Supplemental Statement at 11, 14-15.

The Administration by-laws require notice and publication before rules and regulations can be adopted. These requirements were not met here, but Kansas cites authorities to the effect that parties with actual notice (Colorado) cannot complain about lack of publication. See *United States v. Floyd*, 477 F.2d 217, 222 (10th Cir.) *cert. denied*, 414 U.S. 1044 (1973); *United States v. Aarons*, 310 F.2d 341 (2nd Cir. 1962); *Tearney v. National Transp. Safety Bd.*, 868 F.2d 1451 (5th Cir.), *cert. denied*, 493 U.S. 937 (1989).

Recognizing that the action actually taken by the Administration was a somewhat awkward motion to approve the letter from the Bureau to the Kansas Governor in which the Operating Principles and the five Kansas

conditions were stated, Kansas also submits authorities stating that it is the substance of an action that must be judged, not the label or lack thereof. See *Columbia Broadcasting System v. United States*, 316 U.S. 407, 416 (1942); *A.F. of L. v. National Labor Relations Bd.*, 308 U.S. 401, 408 (1940); *Lewis-Mota v. Secretary of Labor*, 469 F.2d 478, 481-82 (2nd Cir. 1972); *Dresser Industries, Inc. v. Commissioner of Internal Revenue*, 911 F.2d 1128, 1138 (5th Cir. 1990).

However, Kansas' problem is not the lack of forgiving judicial precedents which permit a court to overcome technical deficiencies. Rather, it is the plain fact that the Compact Administration did not do, nor intend to do, what Kansas now claims. The Operating Principles were developed by the Bureau of Reclamation as part of its 1964 study, and came to symbolize the conditions under which that study was made. Those Principles were widely accepted by all other interested parties well before being considered by the Compact Administration. In fact, they had already been included in the February 10, 1967 signed repayment contract between the Bureau of Reclamation and the local Purgatoire River Water Conservancy District. The Operating Principles clearly were not rules of the Compact Administration in any normal sense.

The Governor of Kansas also gave his approval before the Compact Administration took up the matter. Jt. Exh. 45, dated April 11, 1967. His approval was subject to the "acceptance" of the "amended principles" by the Compact Administration. *Id.* The amendment, of course, referred to the addition of the five Kansas conditions. The relationship of those conditions to the original Operating Principles was essentially the only aspect of the Trinidad

Project discussed by the Compact Administration at its June 6, 1967 meeting. Jt. Exh. 19, June 6, 1967 Minutes at 5-7. The acceptance of the amended Operating Principles at that meeting appears to have been the final local clearance needed, as a practical matter, to permit construction of the project.

I have carefully examined the record presented here of the Compact Administration's consideration of the Trinidad Project. I find nothing to indicate that the Compact representatives of either State thought they were exercising binding authority under Article VIII-B. And the consequences of such authority, as argued by Kansas, make it less rather than more appropriate that such action should be implied.

Perhaps the fundamental flaw in the Kansas position can be seen most readily if the facts of this case are turned around. Assume that the Operating Principles were strictly observed, but nonetheless the actual Trinidad operations still caused a material depletion in the usable flows to Kansas users. Under the Kansas legal theory, the State of Kansas would have no recourse so long as the Operating Principles had been adopted by the Compact Administration pursuant to Article VIII-B. The agreement on the Operating Principles would supersede the Compact. During oral argument, this colloquy occurred:

> "Mr. Draper [counsel for Kansas]: Applying that to our situation here, I think it makes clear that Kansas is bound also by the Operating Principles. If it is – that is, when I say 'it,' I mean if the project operated consistent with those – I

think this case tells us directly that Kansas has no complaint under the Compact.

"Special Master: Even if there were a material depletion at the state line?

* * *

"Special Master: . . . If you tell me that you think Kansas is bound in the sense that if the Operating Principles were followed and a material depletion at the state line were to result that it would have no cause of action, haven't you in essence amended the Compact?

"Mr. Draper: No. The Compact Administration has implemented the Compact, your Honor." RT Vol. 94 at 43-44 (March 10, 1992).

Colorado disagrees with this Kansas view, and so do I.[7] Under the assumed facts, Kansas would permit the Compact Administration to write out of the Compact the critical Article IV-D requirement that no new development in Colorado may cause a material depletion in usable flows to Kansas users. Such action would not implement, but rather would amend the Compact. Of course, the Compact Administration was not delegated power to change the Compact. No matter what operational criteria are followed, that is, whether the project is operated in compliance with the Operating Principles, or not, or under appropriately modified Principles, the requirements of Article IV-D must still be met.

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[7] Counsel for Colorado acknowledged during oral argument that Kansas would still have the right to complain about material depletions caused by operation of the Trinidad Project, "even under the Principles." RT Vol. 94 at 8 (March 10, 1992).

Other provisions of the Compact also cast doubt on the "binding" nature of Compact Administration action. Article VIII-H charges the Administration with the responsibility to promptly investigate Compact violations. Its findings and recommendations "may" be reported to the State official charged with the administration of water rights for appropriate action, ". . . it being the intent of this Compact that enforcement of its terms shall be accomplished in general through the State agencies and officials charged with the administration of water rights." Moreover, any Compact Administration procedures involving John Martin are ". . . subject to the approval of the District Engineer in charge of said Project." Article VIII-B(2).

While still maintaining that the State of Colorado and its local conservancy district are bound by the Administration's approval of the Operating Principles, Kansas properly acknowledges that the United States is not. Kansas April 9, 1992 letter. Yet the Kansas train of logic, if indeed it were sound, would lead to precisely the opposite conclusion. Kansas argues that the Arkansas River Compact Administration is an interstate agency created by the Compact; that it is a "federal agency"; that it was expressly delegated certain powers by "federal statute" (i.e., the Compact); that its action in approving the Operating Principles was within its delegated authority, and designed to "implement federal law"; and that violation of a valid regulation is effectively a violation of the statute. Kansas Brief at 5, 10-11; Kansas Supplemental Statement at 10-11. The Kansas argument fails because the Compact Administration was never granted the

authority to bind either Colorado or the United States in the way that Kansas now claims.[8]

The Kansas legal theory on the binding nature of the Operating Principles also runs contrary to the review provisions contained in the Principles themselves. Originally they called for at least one review every ten years. The stated object of such reviews was to amend the criteria to obtain the ". . . optimum beneficial use of water as conditions change, operating experience is gained, and more technical data become available." Jt. Exh. 23, Appendix I at 11. The reference here to "optimum beneficial use" presumably means the same as it does in Article I on Objectives. There it is stated that the project plan provides for: "Optimum beneficial use of the available water for irrigation within the project area consistent with the protection of downstream non-project rights . . . ." *Id.* at 1. The five Kansas conditions shortened the first review period to five years, and added that the Operating Principles be reviewed ". . . to determine the

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[8] Earlier in this case, in ruling on pre-trial motions, I reviewed the history of the Compact negotiations and of its Congressional approval, with respect to the power of the Compact Administration over future federal development. I concluded that ". . . the historical record does not support Kansas' claim that the Compact negotiators intended to give the Compact Administration power to control future Federal operations on the Arkansas River." Report of Special Master re Winter Storage Motions at 16. Article IX of the Compact specifically protects the rights and jurisdiction of the United States over the waters of the Arkansas River basin, provided that the Chief of Engineers is "authorized" to operate the conservation features of John Martin in accord with the Compact, "with such exceptions as he and the Administration . . . may jointly approve."

effect, if any, the operation has had on other Colorado and Kansas water users and the principles amended as necessary." Jt. Exh. 42.

The first required five-year review has now been made. The Bureau found that the Operating Principles, indeed, fail to provide optimum beneficial use for irrigation in the Trinidad Project area; moreover, that modification of the Principles to allow rollover and winter storage would not reduce usable inflow into John Martin Reservoir below without-project conditions. Jt. Exh. 23 at 55. Yet the arguments now advanced by Kansas would give the State of Kansas an absolute veto over any modifications of the Operating Principles.

During oral argument, counsel for Kansas stated:

> "If any amendment [to the Operating Principles] is to be made, it is to be made by the Arkansas River Compact Administration. But until that amendment is made, they are in place and binding." RT Vol. 94 at 27 (March 10, 1992).

If a proposal to modify the Operating Principles were to be put before the Compact Administration, Kansas asserts that each State would hold an "absolute right to veto." Kansas Supplemental Statement at 10.

Kansas claims that its position is supported by Supreme Court decisions in the Pecos River litigation. *Texas v. New Mexico*, 462 U.S. 554, 77 L.Ed.2d 1, 103 S.Ct. 2558 (1983); 482 U.S. 124, 96 L.Ed.2d 105, 107 S.Ct. 2279 (1987). This argument is based in part on the fact that the Pecos River Compact uses the same language regarding findings made by the Pecos River Commission that is used in the Arkansas River Compact for findings made

by the Arkansas River Compact Administration.[9] These decisions, however, do not have the effect Kansas claims for them.

To begin with, the Pecos River Compact gives its Commission specific authority to make findings as to the deliveries of water at the New Mexico-Texas state line, and depletions caused by man's activities in New Mexico. Article V(d)(5),(6), Kansas Brief, Appendix, Item 2. Pursuant to this authority, the Pecos River Commission adopted as "findings of fact" a set of figures showing a cumulative shortfall at the state line of 53,000 AF over the period from 1950 to 1961. *Texas v. New Mexico*, 462 U.S. at 561. Although the Supreme Court accepted these findings, there is nothing to suggest that the Court felt required to do so merely because the Commission representatives of the two States had agreed. Kansas' argument in this respect relies on a statement by the Special Master in the *Texas* case to the effect that the Supreme Court "seems" to have regarded the Commission action as "dispositive." Kansas Brief, Appendix, Item 3 at 18. Elsewhere in his Report, however, *id.* at 5-6, the Special Master explains the Supreme Court language on which he relies. An examination of that language reveals that the

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[9] Article VIII-I of the Arkansas River Compact provides:

> "I. Findings of fact made by the Administration shall not be conclusive in any court or before any agency or tribunal but shall constitute prima facie evidence of the facts found."

Except for punctuation and the word "commission" in place of "Administration," Article V-(f) of the Pecos River Compact is identical.

Court did nothing more than go along with a unanimous finding of the Commission as to river flow depletions for certain years. *Texas v. New Mexico*, 462 U.S. at 575.

I find no support in the Pecos River decisions for Kansas' assertion that the Court "has accepted the proposition that the States are bound by the unanimous action of an interstate agency within the scope of the Compact it is charged to administer." Kansas Brief at 9. The Compact itself limits Administration findings to prima facie effect. Note 9, *supra*. The Compact is a law of the United States, and "unless the compact to which Congress has consented is somehow unconstitutional, no court may order relief inconsistent with its express terms." *Texas v. New Mexico*, 462 U.S. at 564. Kansas' present position thus amounts to a claim that the Supreme Court, without saying so, has ruled that the Compact provision permitting it to review findings is unconstitutional. The Court simply did not do that.

Nor do I agree with Kansas' alternative claim that, even if Administration findings are given only prima facie effect, Colorado has come forward with no evidence sufficient to overcome it. There is ample evidence on which a trier of fact could determine that rollover and winter storage at the Trinidad Project are compatible with the standards established by the Compact.

Even if we consider, for purposes of argument, that the action of the Arkansas River Compact Administration in approving the Operating Principles amounts to a finding, that assumption still does not lead to the conclusion sought by Kansas. At best, such a finding would have to be implied, namely, that operation of the Trinidad Project

according to the 1961-64 Studies and the Operating Principles would not violate Article IV-D. But that fact is not disputed. Rather, it is the failure to so operate that is at issue, and there is certainly no finding on this point. It does not follow from the Administration action, assuming that it amounts to an implied finding, that *failure* to strictly observe the Operating Principles, or to operate differently in any way, would necessarily result in a material depletion. That is the finding that would be required to undergird the Kansas position. Yet there is nothing in the Administration's approval to suggest whether or not any other operating principles would constitute a violation. Indeed, in providing expressly for periodic review, the parties clearly contemplated that there might well be acceptable changes.

Going beyond the subject of findings as such, Kansas argues more broadly in its Supplemental Opposition that the *Texas* case holds that unanimous action of the states, accomplished through the Compact Administration, is to be accorded decisive weight, and that it will not be disturbed by exercise of the Court's original jurisdiction. Dictum in the 1983 opinion in that case is cited to the effect that the Court is not disposed to consider the claims of a state having "second thoughts." 462 U.S. at 570-571. It is contended that Administration approval of the Operating Principles constituted the kind of state action which will not be reviewed by the Court.

The language cited by Kansas was only an incidental comment in a case which did not even involve second thoughts. In the face of *nonaction* by the Pecos River Commission, the Court refused to appoint a third tie-breaking member and instead exercised its own original

jurisdiction to resolve the dispute, rejecting New Mexico's contention that the Court could act only to review decisions actually made by the Commission. Indeed, the real lesson in that decision lies in the Court's strong criticism of any situation where a state may create an advantageous impasse by refusing to give its consent. 462 U.S. at 568-570.

Our case is directly analogous to what the Supreme Court held in the *Texas* case. There, Texas and New Mexico made an agreement (the Pecos River Compact), including a requirement that future findings as to river depletion could be adopted only by unanimous vote of the Commission. Here, the Administration approved the Operating Principles, with the five Kansas conditions, including a requirement that future modification based on periodic review could be authorized only by unanimous consent. As a result, we now face the type of impasse condemned in the *Texas* decision. Responding to New Mexico's claim that Texas should be denied relief, the Court said:

> "In the absence of an explicit provision or other clear indications that a bargain to that effect was made, we shall not construe a compact to preclude a State from seeking judicial relief when the compact does not provide for an equivalent method of vindicating the State's rights." 462 U.S. at 569-570.

I do not find in the Kansas conditions, or in the circumstances surrounding their adoption, any explicit provision or clear indications that Kansas should have a veto power over changes in the Operating Principles. Rather I conclude, as counsel for the United States urged on the

first day of trial, RT Vol. 1 at 32-33 (Sept. 17, 1990), that Kansas' approval of such changes may not be unreasonably withheld.

D. The Need to Show Material Depletion.

From the outset, development of the Trinidad Project was guided by two general aims, improvement of flood protection and irrigation supplies in the local Trinidad area, and protection against significant depletion of usable downstream flows. Those principles run consistently through the first 1953 Review Report, through the 1956 House Document 325, and through the 1961-64 studies. Jt. Exh. 34 at 2-4, 16-21; Jt. Exh. 24a at 20-21; Jt. Exh. 24b, Appendix A at 7, 71 *et seq.*; Jt. Exh. 42. Even in the final letter from the Kansas Governor in which he approved the amended Operating Principles, and removed any further Kansas objection to the project, he characterized Kansas' concern as follows:

> "I appreciate the consideration given by the Bureau of Reclamation and the Purgatoire River Water Conservancy District to the concern of the State of Kansas that the operation of the proposed Trinidad Project not adversely affect the volume of water flowing into John Martin Reservoir." Jt. Exh. 45.

Insofar as Kansas is concerned, the desired protection is established in Article IV-D of the Arkansas River Compact. New dams and reservoirs in Colorado are permitted, provided the flows of the Arkansas River are not materially depleted in usable quantity or availability for use in Kansas. Kansas was never intended to benefit from the Trinidad Project, but rather only to be protected

against material depletions. Jt. Exh. 23 at 20; RT Vol. 18 at 119-20 (Oct. 23, 1990). The Operating Principles were not intended as an end in and of themselves, but were designed to meet those Article IV-D requirements. RT Vol. 18 at 119 (Oct. 23, 1990). They were not calculated to provide Kansas with additional water. Project benefits were to belong to the local Trinidad area, and that area alone paid the full local share of project costs. Jt. Exh. 39. The Bureau wrote in its 1988 Report:

> "Nowhere in either the Operating Principles or the Project history is there any suggestion that downstream users are entitled to any water supply benefits from the Project." Jt. Exh. 23 at 20.

Kansas' expert witness Spronk also testified:

> "Special Master: Were the Operating Principles designed also to provide any benefit from the Trinidad Project to downstream users and particularly to the inflow into John Martin?
>
> "The Witness: From my review of the documents, I do not believe that the project was meant to benefit downstream users. However, there was a grave concern on behalf of downstream users that it not cause any detriment either. And as a result, the Operating Principles are meant to carry out, I think, that protection to downstream users." RT Vol. 18 at 119 (Oct. 23, 1990).

If, for purposes of argument, however, it is assumed as Kansas claims that the Administration's motion constituted Compact action authorized by Article VIII-B, it still does not follow that Kansas has a separate right to enforce the Operating Principles apart from showing a

material depletion. Valid action by the Compact Administration must implement the Compact. In this situation, that means Compact Article IV-D prohibiting material depletion. The States both understood in 1980 that the focus of any Compact violation had to be on material depletion. The investigation authorized by the Compact Administration in 1980, on the basis of the Kansas complaint, was to determine whether the Trinidad operation had "materially depleted" the flows of the Arkansas River. Jt. Exh. 88 at 4.15; RT Vol. 18 at 113-15 (Oct. 23, 1990).

I conclude that the operation of Trinidad Reservoir is subject to the Article IV-D prohibition against material depletion of usable flows. While the Operating Principles were expected to provide that protection, it is not enough to show that they were not fully observed, if the object is to establish a Compact violation. It is the actual operation of the Project that counts, and whether such operation has caused a material depletion.

E. Reliance Upon Average Flows.

The final issue raised by the Kansas evidence and legal arguments is whether average flows can be used to judge compliance with downstream obligations. The Kansas showing of depletions, of course, was tied to its legal theory that it needed to show only a violation of the Operating Principles. As discussed earlier, Spronk calculated depletions during the 1979-84 period based on the difference between actual inflow into John Martin Reservoir during any given month and the inflow that would have occurred, absent any violation of the Operating

Principles. He did not offset such depletions by months in which flows were greater than expected, although he acknowledged that stored water in John Martin could indeed buffer the impact of any depletion if the question were one of injury to Kansas users. RT Vol. 18 at 72 (Oct. 23, 1990). So long as water was available to Kansas from John Martin storage, he agreed that any injury could be "mitigated by the accretions that occur after depletion occurred; or visa versa if there is accretion before the depletion." *Id.* Apparently he made some analysis of the times when the conservation pool in John Martin spilled or was empty, but he offered no details and presented no showing of injury. *Id.*

As a matter of law, in an original action to enforce the Compact in this situation, Kansas must show a material depletion under Article IV-D. Its evidence on depletions was not calculated to do this, and is therefore legally deficient.

Rejection by Kansas of the use of any averages is also contrary to the way the project was viewed as it was being developed and evaluated. Certainly Kansas understood that Trinidad Reservoir, planned in part for conservation, would alter the flow regimen of the Purgatoire River. That is the nature of such a dam, to store water and release it later. The 1961-64 studies were aimed at quantifying such downstream impacts. The 1925-57 study period was judged to be indicative of future conditions. Jt. Exh. 24a at 13. Results were displayed in annual increases and decreases in flow due to the project, resulting in a net average annual increase of 400 AF. *Id.* at 22, Table 8. This average included 21 years in which the project caused an increase in flows into John Martin, and

14 years of decrease. When compared to without-project conditions, the Bureau of Reclamation concluded that the project would increase inflow in 16 of the driest years, and decrease inflow into John Martin during 8 of the 12 wettest years. Jt. Exh. 23 at 26. The largest depletions shown in the 1961-64 studies occurred when John Martin Reservoir would spill, and therefore ". . . would not reduce the usable water. . . ." *Id.* at 28.

Kansas' expert witness Spronk acknowledged that the documents which Kansas had in hand when it gave approval to the project showed average annual impacts. RT Vol. 18 at 120-21 (Oct. 23, 1990). He could point to no occasion when Kansas indicated that the 1961-64 studies were inaccurate or had improperly analyzed impacts. *Id.* at 96-98. I have found no evidence that Kansas did not evaluate the project on the basis of average impacts. The Bureau of Reclamation found that "[b]oth the State of Kansas and the Arkansas River Compact Administration based their approval of the Trinidad Project on the 1961 and 1964 Studies. . . ." Jt. Exh. 23 at 28.

Kansas properly makes the point that the use of averages may sometimes be inappropriate. Water withheld only to be delivered long after it is needed may not mitigate injury. Article IV-D of the Compact protects not only the quantity but also the "availability" of water against material depletion. However, it is clear here that Trinidad Reservoir was analyzed originally on the basis of net average impacts on inflow into John Martin, including annual averages, without objection from Kansas.

F. Administrative Claim Question.

Finally, the United States raises the question, apart from a claim based on depletions of flow, of whether a separate cause of action is available under the Compact to enforce compliance with its investigatory and administrative provisions. The United States asks for a specific ruling on whether Kansas has stated such a valid administrative cause of action, and if so, what proof is required to survive a motion to dismiss.

Colorado takes the view that the allegations in the Kansas complaint, which may suggest that Kansas seeks enforcement of the administrative provisions, have been "effectively abandoned." Colorado Response to Supplemental Statements at 8. Kansas responds that it ". . . has not abandoned its position that it is entitled under the compact to good faith compliance by Colorado with the administrative provisions of the Compact." Kansas letter of April 9, 1992.

I do not believe it is necessary to rule on the broad question of whether an administrative cause of action may ever exist under the Compact. What is potentially at stake here was effectively decided in my pre-trial decision on Colorado's Motion to Stay. Decision of Special Master, dated Oct. 21, 1988. Kansas moved for leave to file its complaint in the Supreme Court on December 16, 1985. Colorado filed a brief in opposition arguing that Kansas had not made a reasonable effort to resolve its concerns through the Compact Administration. In response, on March 3, 1986, Kansas filed a new motion in the alternative, either for leave to file its complaint in the Supreme Court, or to compel an investigation by the

Compact Administration pursuant to Article VIII-H. Without argument, the Supreme Court granted the Kansas motion to file the complaint, giving Colorado 60 days within which to file an answer.

Colorado then filed a motion before me to stay these proceedings on two of the issues in the complaint, i.e., post-Compact well development and the operation of Trinidad Reservoir. The motion was based on the alleged failure by Kansas to exhaust its administrative remedies and sought to return those two issues to the Compact Administration. Both States agreed that a "reasonable effort" to proceed first through the Compact Administration was required. However, Kansas argued vigorously that it had done so for some five years, and that it would be futile to proceed further through the Compact Administration. Kansas thus sought judicial not administrative relief. I denied the Colorado motion, concluding that Kansas had indeed made the requisite effort before the Compact Administration, ". . . but because of the inherent limitations in that procedure, the parties reached an impasse." *Id.* at 5. The Arkansas River Compact, like certain others, requires both States to agree. See *Texas v. New Mexico*, 462 U.S. 554, 568 (1983).

The administrative allegations in the Kansas complaint relate to the need to establish an exhaustion of administrative remedies. Once leave to file its complaint was granted by the Supreme Court, Kansas no longer looked for an administrative remedy.

V.

CONCLUSION

There can be little doubt, as a practical matter, that Trinidad Reservoir would not have been constructed if Kansas had continued to oppose the project. Kansas' ultimate approval represented the kind of good faith cooperation that must be forthcoming if the Compact purposes are to be fulfilled. Kansas appropriately recognized the need to improve flood protection and irrigation supplies for the local Trinidad area, so long as its own Compact entitlement was not adversely impacted. Clearly Kansas relied on the 1961-64 studies and the Operating Principles to provide that necessary downstream protection.

It is understandable, therefore, that Kansas felt wronged when Colorado, its local conservancy district, and the United States, from the first year, failed to operate the project in a way that was consistent with the earlier study conditions. While there may be some dispute about the interpretation of the Operating Principles, there is no doubt that the 1961-64 studies did not include the practice of rollover or the storage of winter water outside of the Model right.

It concerns me that the project was not initially operated according to the earlier understandings, especially since the Operating Principles anticipated review, and modification if necessary. Nonetheless, this is a case involving alleged Compact violations, and I believe that such a claim requires a showing that the Trinidad operations caused a material depletion within the meaning of Article IV-D. Kansas has not established, and did not attempt to establish, such injury. This is not to hold that

the operations of Trinidad Reservoir have not caused the requisite injury, but if so, Kansas did not show it. Nor does this decision mean that Kansas may not have a future claim based on Trinidad Reservoir. Colorado is under a continuing obligation to see that the operation of Trinidad Reservoir does not violate Article IV-D.

While not specifically raised by Colorado's motion, the issue of possible amendments to the Operating Principles remains unresolved. The Bureau of Reclamation has recommended that all interested parties work together to amend the Operating Principles to provide for optimum beneficial use in the Trinidad area "consistent with the protection of downstream non-project rights." Jt. Exh. 23 at 57. It further recommends that any proposed amendments be submitted to the State of Kansas for approval, pursuant to Kansas Condition 2, "provided the amended Operating Principles will not result in less inflow to John Martin Reservoir than would have occurred had the Trinidad Project not been built." *Id.* at 57. I concur in these recommendations. I believe that Kansas' review of any changed operating conditions must be based on whether or not such operation will cause a material depletion of usable flows under Article IV-D of the Compact. Kansas may not unreasonably withhold its approval in order to secure benefits from the Trinidad Project.

Accordingly, for the reasons given throughout this decision, and subject to confirmation by the Supreme Court, the Colorado motion to dismiss Kansas' Trinidad claim is hereby granted.

DATED: June 9, 1992

/s/ Arthur L. Littleworth
Arthur L. Littleworth
Special Master

PROOF OF SERVICE BY MAIL

STATE OF CALIFORNIA, COUNTY OF RIVERSIDE

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years and not a party to the within entitled action; my business address is Best, Best & Krieger, 3750 University Avenue, 400 Mission Square, Riverside, California 92502.

I am readily familiar with Best, Best & Krieger's practice for collecting and processing correspondence for mailing with the United States Postal Service. Under that practice, all correspondence is deposited with the United States Postal Service the same day it is collected and processed in the ordinary course of business.

On June 9, 1992, I served the within **DECISION OF SPECIAL MASTER ON COLORADO'S MOTION TO DISMISS KANSAS' TRINIDAD RESERVOIR CLAIM** by placing a copy of the document in a separate envelope for each addressee named below and addressed to each such addressee as follows:

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On June 9, 1992, at the office of Best, Best & Krieger, 3750 University Avenue, 400 Mission Square, Riverside, California 92502, I sealed and placed each envelope for collection and deposit by Best, Best & Krieger in the United States Postal Service, following ordinary business practices.

I declare under penalty of perjury under the laws of the State of California, that the foregoing is true and correct.

Executed on June 9, 1992, at Riverside, California.

/s/ Sandra L. Simmons
Sandra L. Simmons

No. 105, ORIGINAL

In The

Supreme Court of the United States

October Term, 1985

STATE OF KANSAS,

Plaintiff,

v.

STATE OF COLORADO,

Defendant,

and

UNITED STATES OF AMERICA,

Defendant-Intervenor.

ARTHUR L. LITTLEWORTH, Special Master

REPORT – PART IV

ORDER GRANTING KANSAS' MOTION TO DISMISS COLORADO'S LAKE MCKINNEY COUNTERCLAIM

IN THE SUPREME COURT OF THE UNITED STATES

STATE OF KANSAS, Plaintiff, v. STATE OF COLORADO, Defendant, UNITED STATES OF AMERICA, Defendant-Intervenor.	)	No. 105 Original October Term, 1985

ORDER GRANTING KANSAS' MOTION TO DISMISS COLORADO'S LAKE MCKINNEY COUNTERCLAIM

(Filed Apr. 20, 1992)

The State of Kansas on September 5, 1991 filed a Motion to Dismiss Colorado Counterclaim which embraced two separate issues. The first issue was designated in the motion as the "Lake McKinney Counterclaim," and relates to Paragraph 5 of Colorado's Answer to the First Amended Complaint and Counterclaim filed December 13, 1989. The second part of the Kansas motion dealt with Paragraphs 6 and 7 of the Colorado Counterclaim, and was described as the "Well Counterclaim." The Kansas motion was thoroughly briefed by both States, and, without objection, I have ruled that oral argument on the Lake McKinney issue is not necessary.

The motion was filed under the guidance provided by Rule 41(b) of the Federal Rules of Civil Procedure. While the Federal Rules of Civil Procedure do not technically control actions within the Supreme Court's original

jurisdiction, the Rules may be taken as a guide in original actions. Supreme Court Rule 17.2.[1] The Kansas motion is based on the grounds that the evidence on the Colorado counterclaim has been completed, and that Colorado has shown no right to relief on the facts and the law. The provisions of Rule 41(b) apply to the dismissal of counterclaims. Rule 41(c); see *Sea-Land Service, Inc. v. Banca de Republica de Dominica*, 697 F.Supp. 253, 257 (E.D. La. 1988). It is not clear, however, that all of the evidence which may bear upon the Well Counterclaim has indeed been submitted, and the ruling on that portion of the motion is reserved at this time. With respect to the Lake McKinney Counterclaim, Colorado did indicate that its presentation of evidence was complete. RT Vol. LXXXVII at 157-160 (May 30, 1991).

Article V-E(2) of the Arkansas River Compact provides: "Water released [from John Martin Reservoir] upon concurrent or separate demands shall be applied promptly to beneficial use unless storage thereof downstream is authorized by the [Arkansas River Compact] Administration." Colorado has alleged in its counterclaim that State officials in Kansas violated this provision of the Compact by allowing water released from John Martin

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[1] Effective December 1, 1991, the vehicle for the result sought by the Kansas motion would be Rule 52(c) rather than Rule 41(b). However, all evidence on the Lake McKinney matter had been presented and all briefing had been completed before December 1, 1991. Especially since the Federal Rules of Civil Procedure are only a guide for Supreme Court action, it is appropriate to continue to treat Kansas' motion as one governed by former Rule 41(b).

Reservoir upon demand by Kansas to be stored downstream in Lake McKinney in Kansas, rather than being applied promptly to beneficial use.

Under the Compact, water stored in the conservation pool of John Martin Reservoir constitutes a common resource to be released ". . . upon demands by Colorado and Kansas concurrently or separately at any time during the summer storage period." Article V-C. The prohibition against storage of such releases prevents either State from demanding more water than currently needed and thereby reducing the amount of water available to the other State. However, since 1980, the common pool concept has in effect been abrogated. Under the 1980 Resolution adopted by the Compact Administration, which currently controls reservoir releases, water stored in the conservation pool of John Martin is allocated into separate storage accounts for each State or its users. Demands for releases are charged against such separate, individual accounts. Jt. Exh. 21, Document 29. Under these circumstances, the prohibition against downstream storage of John Martin water appears to be of less significance. Nonetheless, the provisions of Article V-E(2) remain in the Compact and still constitute an obligation binding on each State.

The undisputed evidence shows that Lake McKinney is a small reservoir located north of the Arkansas River in Kansas that is fed by the Amazon Canal. The reservoir is only about twelve feet deep, and has a current capacity of approximately 3600 acre-feet (AF), although it was larger in the earlier years. Since 1952, the only way for certain Great Eastern Ditch Association lands to receive water

from the Arkansas River has been through Lake McKinney. The outlet capacity from Lake McKinney is less than the inlet capacity, resulting in some inevitable short-term retention of water. RT Vol. XXXII at 134-36 (Nov. 28, 1990).

The Kansas witnesses testified that water released from storage in John Martin Reservoir had not been stored in Lake McKinney in violation of the Compact. RT Vol. XXVII at 102-133 (Nov. 13, 1990); RT Vol. XXXII at 123-155 (Nov. 28, 1990); RT Vol. XXXIII at 4-10, 39, 52-60, 99-100 (Nov. 29, 1990); see also Colo. Exh. 21 at 76; Colo. Exh. 33 at 153-58.

The depositions of the Kansas State Water Commissioner for the Lake McKinney area and of another Kansas Division of Water Resources employee were also admitted into evidence. Both men were involved in the local administration of water rights, one with 40 years of experience, and the other with 27. Their instructions were to release water from Lake McKinney ". . . when John Martin water was being diverted into the Great Eastern;" and when John Martin water was going into Lake McKinney, "reservoir water had to be coming out." Colo. Exh. 21 at 76; Colo. Exh. 33 at 153. It was "common knowledge" that John Martin water was not to be held in storage in Lake McKinney. Colo. Exh. 21 at 76. They checked on it often and knew of no such storage. Colo. Exh. 21 at 76-77; Colo. Exh. 33 at 153, 156-57.

Three Colorado witnesses testified on the subject. The first was George Moravec, who flew over the lake on July 29, 1980. He testified that water was then flowing into the lake from the Amazon Canal, but there was only

a small pool of water in the outlet ditch. RT Vol. LX at 71-73, 76 (April 11, 1991). Photographs taken by Mr. Moravec were also introduced into evidence. Colo. Exh. 489-4. The Compact Administration records show that water from John Martin Reservoir was being released to Kansas from June 9, 1980 through August 9, 1980. Jt. Exh. 18, No. 32, Compact Admin. Report for 1979-80, Appendix B-11, p. 33. The transit time for water to travel from John Martin Reservoir to Lake McKinney is approximately four or five days. RT Vol. XXXII at 133, 137 (Nov. 28, 1990); Vol. LXXXVII at 8-15, 21-24 (May 30, 1991); Kan. Exh. 635. The most favorable view of this evidence for Colorado, therefore, is that water from storage in John Martin Reservoir was in Lake McKinney on the single day when Mr. Moravec saw it, namely, July 29, 1980. However, there was no evidence on how long such water remained there, or that the water was not being "promptly applied to beneficial use," as required by the Compact. Lake McKinney does not have the capacity to store all of the water released from John Martin over that two-month period. Most of such releases either had to be diverted and used by other Kansas canal companies, or pass through the lake.[2]

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[2] Large amounts of water were stored and released from John Martin Reservoir during the June-August period. Demands by Kansas from its storage account in John Martin were 31,067 AF in June, 49,600 AF in July, and 13,411 AF in August. Jt. Exh. 18, No. 32, Compact Admin. Report for 1979-80, Appendix B-11, p. 33. Stateline flows during these months were 25,930 AF, 43,370 AF and 22,750 AF, respectively. *Id.*, Appendix B-8, p. 30.

The second Colorado witness was Thomas A. Williamsen who testified as an expert to a study he had made with respect to releases from John Martin, based upon a review of the Great Eastern records and the records of the Arkansas River Compact Administration. He concluded that ". . . water was being stored in Lake McKinney on July 29, 1980, when the Moravec photos were taken." RT Vol. LXIX at 28-29 (April 25, 1991). He testified further that water was being released from John Martin Reservoir at the same time. *Id.* at 29. But Mr. Williamsen did not testify that it was John Martin water that was being stored in Lake McKinney, and he was not asked that question. Releases from John Martin Reservoir are not the only source of water for the Arkansas River in Kansas, and are not the only source of water for Lake McKinney. There are daily contributions of precipitation, tributary inflows, natural base flow of the river, and irrigation return flows.

Mr. Williamsen said that he also found similar instances in 1967, 1968 and 1980 when water was stored in Lake McKinney at the same time that releases were being made from John Martin Reservoir. But, again, he did not testify that the water stored in Lake McKinney came from storage in John Martin Reservoir. Even so, and with the exception of one instance in 1967 when he testified that water was held over from the end of one irrigation season to the next, he concluded generally that there was ". . . a short period of time between storage and release." RT Vol. LXIX at 30 (April 25, 1991). He said that the water ". . . was released shortly after the storage began." *Id.* at 30. Moreover, there was no evidence that these instances were "allowed" by Kansas officials, or

that Colorado lodged any objection at the time, with either Kansas or the Arkansas River Compact Administration. In prior proceedings in this case, both States acknowledged a responsibility to bring any alleged Compact violations first to the attention of the Compact Administration.

Colorado's final witness on this subject was Dr. Jeris A. Danielson, the Colorado State Engineer. He described a 1980 inspection trip which he had made in Kansas, during which he saw water in Lake McKinney. But on cross-examination he acknowledged that he did not know whether or not it was John Martin water. RT Vol. LXXXVII at 15 (May 30, 1991). In fact, it appears from the Compact Administration records that Dr. Danielson visited Lake McKinney some two or three days before the releases from John Martin could have reached the lake. RT Vol. XXXII at 133, 137 (Nov. 28, 1990); Vol. LXXXVII at 8-15, 21-24 (May 30, 1991); Kan. Exh. 635. Kansas moved to strike Dr. Danielson's testimony in regard to his Lake McKinney observations on the ground that such testimony was irrelevant. I do not find that his testimony helped to establish the Colorado counterclaim, but neither do I believe that it was irrelevant. The Kansas Motion to Strike is denied.

Reviewing all of the evidence and the briefs of counsel, I find that Colorado has not established a Compact violation on the part of Kansas officials for allowing the storage of John Martin water in Lake McKinney instead of applying it "promptly to beneficial use."

Kansas has advanced one additional argument in support of its motion. The argument is not necessary to

this decision, but my observations may be helpful for the future. Kansas maintains that any water released from the separate Kansas storage account under the 1980 Resolution was not water released from conservation storage, and hence could not cause a violation of Article V-E(2), even if it were stored in Kansas. This argument presupposes that Article V-E(2) of the Compact is limited to the definition of "conservation storage" which is found in the 1980 Resolution. I do not agree with that interpretation. The Compact simply refers to "releases of stored water," as well as to releases of river flow. Article V-E(1). The Compact then requires that such releases must be "applied promptly to beneficial use," unless downstream storage has been authorized by the Compact Administration. Article V-E(2). It seems to me that water which has been released from conservation storage into the separate Kansas storage account under the 1980 Resolution, yet physically remains in John Martin Reservoir, is still water that is "stored" within the meaning of Article V-E.

The States also spent considerable effort in their briefs arguing the standard of proof required for a motion of this kind. That issue may be important later when significant conflicts in the evidence must be resolved. However, it is not a matter that needs to be settled in order to decide the Lake McKinney portion of this Kansas motion.

Subject to confirmation by the Supreme Court, the Kansas Motion to Dismiss Colorado's Lake McKinney Counterclaim is granted.

DATE: April 20, 1992

s/ Arthur L. Littleworth
Arthur L. Littleworth,
Special Master

PROOF OF SERVICE BY MAIL

STATE OF CALIFORNIA, COUNTY OF RIVERSIDE

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years and not a party to the within entitled action; my business address is Best, Best & Krieger, 3750 University Avenue, 400 Mission Square, Riverside, California 92502.

I am readily familiar with Best, Best & Krieger's practice for collecting and processing correspondence for mailing with the United States Postal Service. Under that practice, all correspondence is deposited with the United States Postal Service the same day it is collected and processed in the ordinary course of business.

On April 20, 1992, I served the within **ORDER GRANTING KANSAS' MOTION TO DISMISS COLORADO'S LAKE MCKINNEY COUNTERCLAIM** by placing a copy of the document in a separate envelope for each addressee named below and addressed to each such addressee as follows:

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On April 20, 1992, at the office of Best, Best & Krieger, 3750 University Avenue, 400 Mission Square, Riverside, California 92502, I sealed and placed each envelope for collection and deposit by Best, Best & Krieger in the United States Postal Service, following ordinary business practices.

I declare under penalty of perjury under the laws of the State of California, that the foregoing is true and correct.

Executed on April 20, 1992, at Riverside, California.

s/ Sandra L. Simmons
Sandra L. Simmons

No. 105, ORIGINAL

In The

Supreme Court of the United States

October Term, 1985

STATE OF KANSAS,

Plaintiff,

v.

STATE OF COLORADO,

Defendant,

and

UNITED STATES OF AMERICA,

Defendant-Intervenor.

ARTHUR L. LITTLEWORTH, Special Master

REPORT – PART V

ORDER GRANTING KANSAS' MOTION TO DISMISS COLORADO'S WELL COUNTERCLAIM

IN THE SUPREME COURT OF THE UNITED STATES

STATE OF KANSAS, Plaintiff,	)	No. 105 Original
v.	)	October Term, 1985
STATE OF COLORADO, Defendant,	)	
UNITED STATES OF AMERICA, Defendant-Intervenor.	)	

ORDER GRANTING KANSAS' MOTION TO DISMISS COLORADO'S WELL COUNTERCLAIM

(Filed Jul. 31, 1992)

On September 5, 1991 Kansas filed a Motion to Dismiss Colorado Counterclaim which addressed two paragraphs of Colorado's "Answer to the First Amended Complaint and Counterclaim" filed December 13, 1989. Part of the motion related to Paragraph 5 of the Colorado counterclaim and was designated as the "Lake McKinney Counterclaim." That portion of the motion was decided by order dated April 20, 1992.

The remainder of the Kansas motion sought to dismiss Paragraph 6 of the Colorado counterclaim, described in the motion as the "Well Counterclaim." In the April 20, 1992 order, I reserved the ruling on this issue because it was not then clear that all of the evidence on the matter had been presented. However, both Kansas and Colorado, as well as the United States, have now rested their

respective cases in chief, and the motion is ripe for decision.

The Kansas motion was filed under Rule 41(b) of the Rules of Civil Procedure, which allows a court to dismiss a claim at the close of a party's evidence on the ground that, upon the facts and the law, the party has failed to establish a right to relief. The substance of Rule 41(b) is now found in Rule 52(c). Under this rule and its predecessor, a court may weigh and consider the evidence, and resolve conflicts. *Stearns v. Beckman Instruments, Inc.*, 737 F.2d 1565, 1567-1568 (Fed. Cir. 1984); *Ellis v. Carter*, 328 F.2d 573, 577 (9th Cir. 1964); see also *Lemelson v. United States*, 752 F.2d 1538, 1547 (Fed. Cir. 1985, Claims Court Rule 41(b)).

The portion of the Colorado counterclaim which is the subject of this motion reads as follows:

> "6. Subsequent to the approval of the Arkansas River Compact by the United States Congress in 1949, state officials charged with the administration of water rights in Kansas have allowed the construction of wells and have permitted ground water appropriations in Kansas that have materially depleted the usable quantity or availability for use to the surface water users in Kansas under the Compact. Those depletions caused Kansas to make additional demands for releases of water stored in John Martin Reservoir pursuant to the Compact to the detriment of water users in Colorado."

Colorado has introduced a large amount of evidence on post-Compact well development in Kansas, on increases in irrigated acreage in Kansas, and on the

alleged impact of these activities on surface flows of the Arkansas River in Kansas. In the opinion of Duane D. Helton, one of Colorado's chief expert witnesses, such pumping has lowered groundwater levels in Kansas, causing increased seepage from the river, and thus reducing surface flows in Kansas. Colorado characterizes such percolation as "transit losses." RT Vol. 86 at 61-62 (May 29, 1991).

Most of this Colorado evidence, however, is not relevant to the Well Counterclaim. Rather, it is directed toward other basic issues in the case, such as Kansas' entitlement under the Compact, the appropriate methodology for determining "usable" stateline flows within the meaning of the Compact, and the question of whether any such transit losses are ". . . relevant as an offset to, or mitigation of, any Kansas claim of material depletion caused by post-Compact developments in Colorado after 1980." Colorado's Brief at 22. None of these issues is being decided in this order. The order involves only the independent Colorado cause of action, stated as a counterclaim, that increased river seepage, or transit losses, in Kansas have caused injury to upstream water users in Colorado, in violation of the Compact.

To consider the Well Counterclaim, some general understanding is required of the conditions under which Arkansas River water is stored in and released from John Martin Reservoir. Completed just before the Compact was negotiated, this large Federal reservoir is located on the mainstream of the Arkansas about sixty miles upstream from the Colorado-Kansas state line.

Under the 1949 Arkansas River Compact, a "conservation pool" is established in the reservoir, to be operated ". . . for the benefit of water users in Colorado and Kansas, both upstream and downstream from John Martin Dam. . . ." Article IV-C3. During the winter months, from November 1 through March 31, all water entering the reservoir is stored in the conservation pool, except that Colorado has the right to releases of 100 cfs. Article V-A.

During the summer, defined as April 1 to October 31, no flows may be stored in John Martin Reservoir when Colorado water users are operating under judicially decreed priorities. Article V-B. Under these conditions, Kansas is not entitled to any portion of the river flow entering John Martin Reservoir, but is apportioned the river flow that crosses the state line. Article V-G. Downstream from John Martin, the return flow from Colorado users in the area and occasional tributary inflow contribute to the flow of the river reaching the state line. When Colorado water users are not operating under decreed priorities, all summer flows entering the reservoir are stored, provided that Colorado may demand releases of water equivalent to the river flow up to 500 cfs, and Kansas may demand releases of water equivalent to that portion of the river flow between 500 cfs and 750 cfs. Article V-B.

Under the Compact, neither State is allocated a specific share of the water stored in the conservation pool. Rather, such stored water constitutes a common resource to be released ". . . upon demands by Colorado and Kansas concurrently or separately at any time during the summer storage period." Article V-C. Specific release

rates are provided for each State, depending upon the amount of water in storage. *Id.* The only limit, however, on the total amount of stored water that either State may take is the requirement that such water must be applied promptly to beneficial use, unless storage thereof downstream is authorized by the Administration. Article V-E(2). Obviously, it is not a system that encourages restraint in water use, or calling for water only at times when it would be most useful to the crops. Water demanded by the first State to call automatically reduces the supply available to the other. According to Colorado, the result was that "both States generally demanded simultaneous releases at the maximum rates to insure that they received their share of water stored in the reservoir." Colorado's Statement of Each State's Entitlements Under the Arkansas River Compact at 55-56.

The Compact also provides that the storage, releases from storage, and releases of river flow shall be accomplished pursuant to procedures prescribed by the Compact Administration. Article V-E(6). Presumably, this authority is the basis for certain changes effected by a resolution adopted on April 24, 1980.

Entitled "Resolution Concerning an Operating Plan for John Martin Reservoir," Jt. Exh. 21, Document 29, this resolution substantially modifies the method of operating John Martin Reservoir. The common pool concept is abandoned in favor of allocating specific State shares in the stored water. The preamble to the resolution recognizes that ". . . because of changes in the regime of the Arkansas River, the present operation of the conservation features of John Martin Reservoir does not result in the most efficient utilization possible of the water under its

control." *Id.* The Compact Administration then goes on to find that the Operating Plan which establishes individual storage accounts does result in a more efficient utilization of water, and that the provisions of the new Operating Plan are permitted by and are in compliance with the Compact.[1]

Under the 1980 Operating Plan, 40% of the stored water goes into a separate "Kansas account," while 60% is divided in varying shares among the nine Colorado canal companies located within Colorado Water District 67. Section II-D(2)(3). As to releases of water from these accounts, the Operating Plan provides:

> "Kansas and the various Colorado ditches may demand the release of water contained in their respective accounts . . . at any time and at whatever rates they desire." Section II-E(1).

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[1] In its Pre-trial Statement, at pages 165-166, Kansas took the position that:

> ". . . while Kansas believes that the 1980 Resolution results in a more efficient operation of John Martin Reservoir . . . the resolution is an administrative rewriting of Article V of the Arkansas River Compact and thus is *ultra vires* and legally void *ab initio.*"

It may be that this is the Kansas position only if the 1980 Resolution is considered as an accord and satisfaction of all Kansas claims against Colorado. See Colorado's Brief at 19. In any event, the 1980 Plan has remained in operation continuously since its adoption. Kansas has not exercised its right to terminate it by giving notice on or before February 1 of any Compact year. See 1980 Resolution, Section VII-A. Moreover, during the trial, witnesses for both States supported the continuation of the Plan.

The 1980 Operating Plan also allows three Colorado canal companies, namely, Amity Mutual Irrigation Company, Fort Lyon Canal, and Las Animas Consolidated Canal Company, to store certain "other water" in John Martin Reservoir. Section III-A, B, C. The permitted storage consists of water which Amity could otherwise divert from the Arkansas River and store in the Great Plains Reservoir system, and water which the other two canal companies could store under an approved Pueblo winter storage Plan. Section III-A, B, C.

In exchange for this storage right, the three Colorado canal companies agreed to a 35 percent water charge on all their deliveries into John Martin Reservoir. Section III-D. This 35 percent goes into a Kansas Transit Loss Account. Colorado explains the purpose of this account as follows:

> "The purpose of the Kansas Transit Loss Account was to ensure that releases from the Kansas Account upon demand by Kansas were satisfied by 'an equivalent in Stateline flow.' *See* Arkansas River Compact, Art. V-E(3). During the 1970's, the Compact Administration did not always release sufficient water from John Martin Reservoir to satisfy the releases to which Kansas was entitled by an equivalent in Stateline flow. *See* Transcript, Vol. LXXXIV (May 24, 1991) at 105 (testimony of D. Helton). The Kansas Transit Loss Account was created to address the problem." Colorado's Brief at 16.

Releases of stored water from the Kansas Account are measured at the state line, and transit losses between John Martin and the state line are made up from this Kansas Transit Loss Account. Section II-E(4).

If such losses exceed the amount in the account, the deficit is made up out of future contributions from the 35 percent storage charge. If, however, during any compact year, the transit losses are less than the amount in the Kansas Transit Loss Account, then the excess is transferred 11/35ths into the Kansas Storage Account, and 24/35ths into the storage accounts of the Colorado Water District 67 ditches. Section III-D; Colorado's Brief at 17.

Colorado's evidence in support of its Well Counterclaim is based solely upon operation of the 1980 Resolution and Operating Plan. In terms of timing, the evidence was limited to the period from 1980 to 1990. RT Vol. 115 at 30 (May 22, 1992). Colorado's sole expert witness on the issue was Duane D. Helton.

It is the Colorado position, supported by the testimony of Mr. Helton and certain exhibits, that the development of post-Compact wells in Kansas has reduced the usable flow of the Arkansas River in Kansas by causing increased seepage or transit losses; that this increase in transit losses has resulted in increased demands by Kansas against its storage account in John Martin; and that increased storage releases to Kansas have required additional releases from the Kansas Transit Loss Account, thus reducing the amount of surplus in the Transit Loss Account, 24/35ths of which would otherwise be distributed to Colorado users. RT Vol. 86 at 135-38 (May 29, 1991); RT Vol. 115 at 30-31 (May 22, 1992); Colorado Brief at 13-15, 17. In analyzing these arguments, it is important to remember that the Transit Loss Account is a creation of the 1980 Operating Plan. There is no such account in the Compact itself.

Colorado did not initially quantify its alleged loss, and the Kansas motion was based partially on that omission. In a later segment of the trial, however, over Kansas' objection, Colorado attempted to meet this argument through further testimony from Mr. Helton. He testified to additional seepage losses in Kansas from 1980 to 1990, over and above average losses from 1950-69. RT Vol. 115 at 34-36 (May 22, 1992). That added testimony is still insufficient to prove the amount of Colorado's claim, but there is a far more basic flaw in the Colorado position. The Colorado claim rests upon the allegation, as stated in the counterclaim, that Kansas made "additional demands" for releases of water stored in John Martin, thereby depleting the Transit Loss Account and the surplus otherwise available to Colorado. Colorado Counterclaim, Para. 6. However, there were no such additional or increased Kansas demands for stored water.

After 1980, Kansas had its own storage account in John Martin Reservoir. It had a right to call for all of the water stored in its account, and it did so. The 1980 Operating Plan did not place any limits on the amounts or frequency of the Kansas calls. The record is replete with evidence that users in both Colorado and Kansas generally take all the river water that is usable and legally available during the irrigation season. There is no support in the record for the notion that Kansas users would not have taken all the water available in the Kansas Storage Account even if transit losses in Kansas had been less.

Theoretically, in the years before the 1980 Operating Plan, the amount of usable surface flow in Kansas might have influenced its draws upon the conservation pool in

John Martin, which then was a common resource for the two States. However, Mr. Helton testified that during the 1970s any increased percolation in Kansas would not have affected its use of conservation storage, and that Kansas would have called for the release of all such water without regard to transit losses. RT Vol. 115 at 33-34 (May 22, 1992). And before the 1970s, Mr. Helton testified there was not really any large impact from wells in Kansas. RT Vol. 115 at 33 (May 22, 1992). Several times Mr. Helton indicated that "without" the 1980 storage account plan, Kansas' draft against conservation storage would have increased in the later years. RT Vol. 86 at 138 (May 29, 1991); RT Vol. 115 at 30, 31 (May 22, 1992). But, of course, that testimony does not establish the counterclaim. The evidence supporting Colorado's Well Counterclaim depends upon the existence of the 1980 Operating Plan, and the sharing of the surplus in the Kansas Transit Loss Account which was thereby created.

The 1980 Operating Plan requires both States to do their utmost to achieve maximum beneficial use of the stored water, including ". . . calling for deliveries of Kansas account water during reasonable and favorable river conditions." (Section II-E(5). There is no Colorado evidence that Kansas failed to meet its obligations. Moreover, when transit losses are ". . . deemed by the Colorado Division Engineer to be excessive," he is required to so advise the receiving entity. Section II-E(5). Again, Colorado presented no testimony on this point.

During the most recent segment of the trial, Mr. Helton was questioned concerning the impact of post-Compact well development in Kansas ". . . on its demand for releases from John Martin Reservoir." RT Vol. 115 at

27 (May 22, 1992). In response, Mr. Helton presented estimates of increased river seepage in Kansas for each year from 1980 through 1990, compared to the 1950-69 average. RT Vol. 115 at 34-36 (May 22, 1992). However, there was no tie-in to any "increased" demands on Kansas' storage account, nor quantification of any impact upon the Transit Loss Account or upon any surplus lost to Colorado. Indeed, there was no evidence that any surplus existed at all.

I find, therefore, that Colorado has not shown additional demands by Kansas for releases against its storage account, resulting in loss to Colorado users of surplus water in the Transit Loss Account.

Finally, there is considerable argument in the briefs concerning the nature of the 1980 Resolution, and whether it is being or can be used as an affirmative defense or to establish an accord and satisfaction or estoppel. None of that argument, however, is relevant to the limited question whether Colorado has proved its Well Counterclaim. That claim is based upon actual operations under the approved 1980 Operating Plan. If that Plan has broader implications in this case, no such issues are necessary to a decision on the Kansas motion, and they are not decided herein.

Subject to confirmation by the Supreme Court, the Kansas Motion to Dismiss Colorado's Well Counterclaim is hereby granted.

DATED: July 31, 1992

/s/ Arthur L. Littleworth
Arthur L. Littleworth,
Special Master

PROOF OF SERVICE BY MAIL

STATE OF CALIFORNIA, COUNTY OF RIVERSIDE

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years and not a party to the within entitled action; my business address is Best, Best & Krieger, 3750 University Avenue, 400 Mission Square, Riverside, California 92502.

I am readily familiar with Best, Best & Krieger's practice for collecting and processing correspondence for mailing with the United States Postal Service. Under that practice, all correspondence is deposited with the United States Postal Service the same day it is collected and processed in the ordinary course of business.

On July 31, 1992, I served the within **ORDER GRANTING KANSAS' MOTION TO DISMISS COLORADO'S WELL COUNTERCLAIM** by placing a copy of the document in a separate envelope for each addressee named below and addressed to each such addressee as follows:

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On July 31, 1992, at the office of Best, Best & Krieger, 3750 University Avenue, 400 Mission Square, Riverside, California 92502, I sealed and placed each envelope for collection and deposit by Best, Best & Krieger in the United States Postal Service, following ordinary business practices.

I declare under penalty of perjury under the laws of the State of California, that the foregoing is true and correct.

Executed on July 31, 1992, at Riverside, California.

/s/ Sandra L. Simmons
Sandra L. Simmons

No. 105, ORIGINAL

In The

Supreme Court of the United States

October Term, 1985

STATE OF KANSAS,

Plaintiff,

v.

STATE OF COLORADO,

Defendant,

and

UNITED STATES OF AMERICA,

Defendant-Intervenor.

ARTHUR L. LITTLEWORTH, Special Master

REPORT – APPENDIX (EXHIBITS 1 - 13)

July 1994

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APPENDIX – Exhibit 1

Arkansas River Compact, 1948

ARKANSAS RIVER COMPACT, 1948

The State of Colorado and the State of Kansas, parties signatory to this Compact (hereinafter referred to as "Colorado" and "Kansas", respectively, or individually as a "State", or collectively as the "States") having resolved to conclude a compact with respect to the waters of the Arkansas River, and being moved by considerations of interstate comity, having appointed commissioners as follows: "Henry C. Vidal, Gail L. Ireland, and Harry B. Mendenhall, for Colorado; and George S. Knapp, Edward F. Arn, William E. Leavitt, and Roland H. Tate, for Kansas"; and the consent of the Congress of the United States to negotiate and enter into an interstate compact not later than January 1, 1950, having been granted by Public Law 34, 79th Congress, 1st Session, and pursuant thereto the President having designated Hans Kramer as the representative of the United States, the said commissioners for Colorado and Kansas, after negotiations participated in by the representatives of the United States, have agreed as follows:

ARTICLE I

The major purposes of this Compact are to:

A. Settle existing disputes and remove causes of future controversy between the States of Colorado and Kansas, and between citizens of one and citizens of the other State, concerning the waters of the Arkansas River and their control, conservation and utilization for irrigation and other beneficial purposes.

B. Equitably divide and apportion between the States of Colorado and Kansas the waters of the Arkansas River and their utilization as well as the benefits arising from the construction, operation and maintenance by the United States of John Martin Reservoir Project for water conservation purposes.

ARTICLE II

The provisions of this Compact are based on (1) the physical and other conditions peculiar to the Arkansas River and its natural drainage basin, and the nature and location of irrigation and other developments and facilities in connection therewith; (2) the opinion of the United States Supreme Court entered December 6, 1943, in the case of *Colorado v. Kansas* (320 U.S. 383) concerning the relative rights of the respective States in and to the use of waters of the Arkansas River; and (3) the experience derived under various interim executive agreements between the two States apportioning the waters released from the John Martin Reservoir as operated by the Corps of Engineers.

ARTICLE III

As used in this Compact:

A. The word "Stateline" means the geographical boundary line between Colorado and Kansas.

B. The term "waters of the Arkansas River" means the waters originating in the natural drainage basin of the Arkansas River, including its tributaries, upstream from

the Stateline, and excluding waters brought into the Arkansas River Basin from other river basins.

C. The term "Stateline flow" means the flow of waters of the Arkansas River as determined by gaging stations located at or near the Stateline. The flow as determined by such stations, whether located in Colorado or Kansas, shall be deemed to be the actual Stateline flow.

D. "John Martin Reservoir Project" is the official name of the facility formerly known as Caddoa Reservoir Project, authorized by the Flood Control Act of 1936, as amended, for construction, operation and maintenance by the War Department, Corps of Engineers, later designated as the Corps of Engineers, Department of the Army, and herein referred to as the "Corps of Engineers". "John Martin Reservoir" is the water storage space created by "John Martin Dam".

E. The "flood control storage" is that portion of the total storage space in John Martin Reservoir allocated to flood control purposes.

F. The "conservation pool" is that portion of the total storage space in John Martin Reservoir lying below the flood control storage.

G. The "ditches of Colorado Water District 67" are those ditches and canals which divert water from the Arkansas River or its tributaries downstream from John Martin Dam for irrigation use in Colorado.

H. The term "river flow" means the sum of the flows of the Arkansas and the Purgatoire Rivers into John Martin Reservoir as determined by gaging stations appropriately located above said Reservoir.

I. The term "the Administration" means the Arkansas River Compact Administration established under Article VIII.

ARTICLE IV

Both States recognize that:

A. This Compact deals only with the waters of the Arkansas River as defined in Article III.

B. This Compact is not concerned with the rights, if any, of the State of New Mexico or its citizens in and to the use in New Mexico of waters of Trinchera Creek or other tributaries of the Purgatoire River, a tributary of the Arkansas River.

C. (1) John Martin Dam will be operated by the Corps of Engineers to store and release the waters of the Arkansas River in and from John Martin Reservoir for its authorized purposes.

(2) The bottom of the flood control storage is presently fixed by the Chief of Engineers, U.S. Army, at elevation 3,851 feet above mean sea level. The flood control storage will be operated for flood control purposes and to those ends will impound or regulate the streamflow volumes that are in excess of the then available storage capacity of the conservation pool. Releases from the flood control storage may be made at times and rates determined by the Corps of Engineers to be necessary or advisable without regard to ditch diversion capacities or requirements in either or both States.

(3) The conservation pool will be operated for the benefit of water users in Colorado and Kansas, both

upsteam and downstream from John Martin Dam, as provided in this Compact. The maintenance of John Martin Dam and appurtenant works may at times require the Corps of Engineers to release waters then impounded in the conservation pool or to prohibit the storage of water therein until such maintenance work is completed. Flood control operation may also involve temporary utilization of conservation storage.

D. This Compact is not intended to impede or prevent future beneficial development of the Arkansas River basin in Colorado and Kansas by Federal or State agencies, by private enterprise, or by combinations thereof, which may involve construction of dams, reservoir, and other works for the purposes of water utilization and control, as well as the improved or prolonged functioning of existing works: Provided, that the waters of the Arkansas River, as defined in Article III, shall not be materially depleted in usable quantity or availability for use to the water users in Colorado and Kansas under this Compact by such future development or construction.

ARTICLE V

Colorado and Kansas hereby agree upon the following basis of apportionment of the waters of the Arkansas River:

A. Winter storage in John Martin Reservoir shall commence on November 1st of each year and continue to and include the next succeeding March 31st. During said period all water entering said reservoir up to the limit of the then available conservation capacity shall be stored: Provided, that Colorado may demand releases of water

equivalent to the river flow, but such releases shall not exceed 100 c.f.s. (cubic feet per second) and water so released shall be used without avoidable waste.

B. Summer storage in John Martin Reservoir shall commence on April 1st of each year and continue to and include the next succeeding October 31st. During said period, except when Colorado water users are operating under decreed priorities as provided in paragraphs F and G of this Article, all water entering said reservoir up to the limit of the then available conservation capacity shall be stored: Provided, that Colorado may demand releases of water equivalent to the river flow up to 500 c.f.s., and Kansas may demand releases of water equivalent to that portion of the river flow between 500 c.f.s. and 750 c.f.s., irrespective of releases demanded by Colorado.

C. Releases of water stored pursuant to the provisions of paragraphs A and B of this Article shall be made upon demands by Colorado and Kansas concurrently or separately at any time during the summer storage period. Unless increases to meet extraordinary conditions are authorized by the Administration, separate releases of stored water to Colorado shall not exceed 750 c.f.s., separate releases of stored water to Kansas shall not exceed 500 c.f.s., and concurrent releases of stored water shall not exceed a total of 1,250 c.f.s.: Provided, that when water stored in the conservation pool is reduced to a quantity less than 20,000 acre-feet, separate releases of stored water to Colorado shall not exceed 600 c.f.s., separate releases of stored water to Kansas shall not exceed 400 c.f.s., and concurrent releases of stored water shall not exceed 1,000 c.f.s.

D. Releases authorized by paragraphs A, B and C of this Article, except when all Colorado water users are operating under decreed priorities as provided in paragraphs F and G of this Article, shall not impose any call on Colorado water users that divert waters of the Arkansas River upstream from John Martin Dam.

E. (1) Releases of stored water and releases of river flow may be made simultaneously upon the demands of either or both States.

(2) Water released upon concurrent or separate demands shall be applied promptly to beneficial use unless storage thereof downstream is authorized by the Administration.

(3) Releases of river flow and of stored water to Colorado shall be measured by gaging stations located at or near John Martin Dam and the releases to which Kansas is entitled shall be satisfied by an equivalent in Stateline flow.

(4) When water is released from John Martin Reservoir appropriate allowances as determined by the Administration shall be made for the intervals of time required for such water to arrive at the points of diversion in Colorado and at the Stateline.

(5) There shall be no allowance or accumulation of credits or debits for or against either State.

(6) Storage, releases from storage and releases of river flow authorized in this Article shall be accomplished pursuant to procedures prescribed by the Administration under the provisions of Article VIII.

F. In the event the Administration finds that within a period of fourteen (14) days the water in the conservation pool will be or is liable to be exhausted, the Administration shall forthwith notify the State Engineer of Colorado, or his duly authorized representative, that commencing upon a day certain within said fourteen (14) day period, unless a change of conditions justifies cancellation or modification of such notice, Colorado shall administer the decreed rights of water users in Colorado Water District 67 as against each other and as against all rights now or hereafter decreed to water users diverting upstream from John Martin Dam on the basis of relative priorities in the same manner in which their respective priority rights were administered by Colorado before John Martin Reservoir began to operate and as though John Martin Dam had not been constructed. Such priority administration by Colorado shall be continued until the Administration finds that water is again available in the conservation pool for release as provided in this Compact, and timely notice of such finding shall be given by the Administration to the State Engineer of Colorado or his duly authorized representative: Provided, that except as controlled by the operation of the preceding provisions of this paragraph and other applicable provisions of this Compact, when there is water in the conservation pool the water users upstream from John Martin Reservoir shall not be affected by the decrees to the ditches in Colorado Water District 67. Except when administration in Colorado is on a priority basis the water diversions in Colorado Water District 67 shall be administered by Colorado in accordance with distribution agreements made

from time to time between the water users in such District and filed with the Administration and with the State Engineer of Colorado or, in the absence of such agreement, upon the basis of the respective priority decrees, as against each other, in said District.

G. During periods when Colorado reverts to administration of decreed priorities, Kansas shall not be entitled to any portion of the river flow entering John Martin Reservoir. Waters of the Arkansas River originating in Colorado which may flow across the Stateline during such periods are hereby apportioned to Kansas.

H. If the usable quantity and availability for use of the waters of the Arkansas River to water users in Colorado Water District 67 and Kansas will be thereby materially depleted or adversely affected, (1) priority rights now decreed to the ditches of Colorado Water District 67 shall not hereafter be transferred to other water districts in Colorado or to points of diversion or places of use upstream from John Martin Dam; and (2) the ditch diversion rights from the Arkansas River in Colorado Water District 67, and of Kansas ditches between the Stateline and Garden City shall not hereafter be increased beyond the total present rights of said ditches, without the Administration, in either case (1) or (2), making findings of fact that no such depletion or adverse effect will result from such proposed transfer or increase. Notice of legal proceedings for any such proposed transfer or increase shall be given to the Administration in the manner and within the time provided by the laws of Colorado or Kansas in such cases.

ARTICLE VI

A. (1) Nothing in this Compact shall be construed as impairing the jurisdiction of Kansas over the waters of the Arkansas River that originate in Kansas and over the waters that flow from Colorado across the Stateline into Kansas.

(2) Except as otherwise provided, nothing in this Compact shall be construed as supplanting the administration by Colorado of the rights of appropriators of waters of the Arkansas River in said State as decreed to said appropriators by the courts of Colorado, nor as interfering with the distribution among said appropriators by Colorado, nor as curtailing the diversion and use for irrigation and other beneficial purposes in Colorado of the waters of the Arkansas River.

B. Inasmuch as the Frontier Canal diverts waters of the Arkansas River in Colorado west of the Stateline for irrigation uses in Kansas only, Colorado concedes to Kansas and Kansas hereby assumes exclusive administrative control over the operation of the Frontier Canal and its headworks for such purposes, to the same extent as though said works were located entirely within the State of Kansas. Water carried across the Stateline in the Frontier Canal or another similarly situated canal shall be considered to be part of the Stateline flow.

ARTICLE VII

A. Each State shall be subject to the terms of this Compact. Where the name of the State or the term "State" is used in this Compact these shall be construed to

include any person or entity of any nature whatsoever using, claiming or in any manner asserting any right to the use of the waters of the Arkansas River under the authority of that State.

B. This Compact establishes no general principle or precedent with respect to any other interstate stream.

C. Wherever any State or Federal official or agency is referred to in this Compact such reference shall apply to the comparable official or agency succeeding to their duties and functions.

ARTICLE VIII

A. To administer the provisions of this Compact there is hereby created an interstate agency to be known as the Arkansas River Compact Administration herein designated as "The Administration."

B. The Administration shall have power to:

(1) Adopt, amend and revoke by-laws, rules and regulations consistent with the provisions of this Compact;

(2) Prescribe procedures for the administration of this Compact: Provided, that where such procedures involve the operations of John Martin Reservoir Project they shall be subject to the approval of the District Engineer in charge of said Project;

(3) Perform all functions required to implement this Compact and to do all things necessary, proper or convenient in the performance of its duties.

C. The membership of the Administration shall consist of three representatives from each State who shall be appointed by the respective Governors for a term not to exceed four years. One Colorado representative shall be a resident of and water right owner in Water Districts 14 or 17, one Colorado representative shall be a resident of and water right owner in Water District 67, and one Colorado representative shall be the Director of the Colorado Water Conservation Board. Two Kansas representatives shall be residents of and water right owners in the counties of Finney, Kearny or Hamilton, and one Kansas representative shall be the chief State official charged with the administration of water rights in Kansas. The President of the United States is hereby requested to designate a representative of the United States, and if a representative is so designated he shall be an ex-officio member and act as chairman of the Administration without vote.

D. The State representatives shall be appointed by the respective Governors within thirty days after the effective date of this Compact. The Administration shall meet and organize within sixty days after such effective date. A quorum for any meeting shall consist of four members of the Administration: Provided, that at least two members are present from each State. Each State shall have but one vote in the Administration and every decision, authorization or other action shall require unanimous vote. In case of a divided vote on any matter within the purview of the Administration, the Administration may, by subsequent unanimous vote, refer the matter for arbitration to the Representative of the United States or other arbitrator or arbitrators, in which event

the decision made by such arbitrator or arbitrators shall be binding upon the Administration.

E. (1) The salaries, if any, and the personal expenses of each member shall be paid by the government which he represents. All other expenses incident to the administration of this Compact which are not paid by the United States shall be borne by the States on the basis of 60 per cent by Colorado and 40 per cent by Kansas.

(2) In each even numbered year the Administration shall adopt and transmit to the Governor of each State its budget covering anticipated expenses for the forthcoming biennium and the amount thereof payable by each State. Each State shall appropriate and pay the amount due by it to the Administration.

(3) The Administration shall keep accurate accounts of all receipts and disbursements and shall include a statement thereof, together with a certificate of audit by a certified public accountant, in its annual report. Each State shall have the right to make an examination and audit of the accounts of the Administration at any time.

F. Each State shall provide such available facilities, equipment and other assistance as the Administration may need to carry out its duties. To supplement such available assistance the Administration may employ engineering, legal, clerical, and other aid as in its judgment may be necessary for the performance of its functions. Such employees shall be paid by and be responsible to the Administration, and shall not be considered to be employees of either State.

G. (1) The Administration shall cooperate with the chief official of each State charged with the administration of water rights and with Federal agencies in the systematic determination and correlation of the facts as to the flow and diversion of the waters of the Arkansas River and as to the operation and siltation of John Martin Reservoir and other related structures. The Administration shall cooperate in the procurement, interchange, compilation and publication of all factual data bearing upon the administration of this Compact without, in general, duplicating measurements, observations or publications made by State or Federal agencies. State officials shall furnish pertinent factual data to the Administration upon its request. The Administration shall, with the collaboration of the appropriate Federal and State agencies, determine as may be necessary from time to time, the location of gaging stations required for the proper administration of this Compact and shall designate the official records of such stations for its official use.

(2) The Director, U.S. Geological Survey, the Commissioner of Reclamation and the Chief of Engineers, U.S. Army, are hereby requested to collaborate with the Administration and with appropriate State officials in the systematic determination and correlation of data referred to in paragraph G (1) of this Article and in the execution of other duties of such officials which may be necessary for the proper administration of this Compact.

(3) If deemed necessary for the administration of this Compact, the Administration may require the installation and maintenance, at the expense of water users, of measuring devices of approved type in any ditch or groups of ditches diverting water from the Arkansas

River in Colorado or Kansas. The chief official of each State charged with the administration of water rights shall supervise the execution of the Administration's requirements for such installations.

H. Violation of any of the provisions of this Compact or other actions prejudicial thereto which come to the attention of the Administration shall be promptly investigated by it. When deemed advisable as the result of such investigation, the Administration may report its findings and recommendations to the State official who is charged with the administration of water rights for appropriate action, it being the intent of this Compact that enforcement of its terms shall be accomplished in general through the State agencies and officials charged with the administration of water rights.

I. Findings of fact made by the Administration shall not be conclusive in any court or before any agency or tribunal but shall constitute prima facie evidence of the facts found.

J. The Administration shall report annually to the Governors of the States and to the President of the United States as to matters within its purview.

ARTICLE IX

A. This Compact shall become effective when ratified by the Legislature of each State and when consented to by the Congress of the United States by legislation providing substantially, among other things, as follows:

"Nothing contained in this Act or in the Compact herein consented to shall be construed as impairing or

affecting the sovereignty of the United States or any of its rights or jurisdiction in and over the area or waters which are the subject of such Compact: Provided, that the Chief of Engineers is hereby authorized to operate the conservation features of the John Martin Reservoir Project in a manner conforming to such Compact with such exceptions as he and the Administration created pursuant to the Compact may jointly approve."

B. This Compact shall remain in effect until modified or terminated by unanimous action of the States and in the event of modification or termination all rights then established or recognized by this Compact shall continue unimpaired.

IN WITNESS WHEREOF, The commissioners have signed this Compact in triplicate original, one of which shall be forwarded to the Secretary of State of the United States of America and one of which shall be forwarded to the Governor of each signatory State.

Done in the City and County of Denver, in the state of Colorado, on the fourteenth day of December, in the Year of our Lord One Thousand Nine Hundred and Forty-eight.

Henry C. Vidal
Gail L. Ireland
Harry B. Mendenhall
Commissioners for Colorado

George S. Knapp
Edward F. Arn
William E. Leavitt
Roland H. Tate
Commissioners for Kansas

Attest:
Warden L. Noe
Secretary

Approved:
Hans Kramer
Representative of the United States

APPENDIX – Exhibit 2

First Amended Complaint, filed November 13, 1989

No. 105, Original

In The
Supreme Court of the United States
October Term, 1985

Before The Honorable Arthur L. Littleworth,
Special Master

State of Kansas

Plaintiff,

v.

State of Colorado

Defendant,

and

United States of America

Defendant-Intervenor.

FIRST AMENDED COMPLAINT
(Filed Nov. 13, 1989)

Robert T. Stephan
Attorney General of Kansas
2nd Floor, Kansas Judicial Center
Topeka, Kansas 66612

John W. Campbell
Deputy Attorney General

Leland E. Rolfs
Assistant Attorney General

RICHARD A. SIMMS
Special Assistant Attorney General
Counsel of Record

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121 Sandoval Street
Post Office Box 280
Santa Fe, New Mexico 87504
(505) 983-3880

November 10, 1989

No. 105, Original

IN THE
Supreme Court of the United States
October Term, 1985

Before The Honorable Arthur L. Littleworth,
Special Master

STATE OF KANSAS

Plaintiff,

v.

STATE OF COLORADO

Defendant,

and

UNITED STATES OF AMERICA

Defendant-Intervenor.

FIRST AMENDED COMPLAINT

The State of Kansas, by its Attorney General, the Honorable Robert T. Stephan, brings this suit against the Defendant, State of Colorado, and for its cause of action states:

1. The jurisdiction of the Court is invoked under Article III, Section 2, Clause 2 of the Constitution of the United States and Paragraph (a), Section 1251, Title 28 of the United States Code.

2. The Arkansas River is an interstate river which rises near Leadville, Colorado and flows south to Salida, Colorado, east through Canon City and Pueblo, and across southeastern Colorado into the State of Kansas.

3. In order to resolve existing and future controversies and to divide and equitably apportion the water of the Arkansas River, Congress consented to the negotiation of a compact by the states of Colorado and Kansas. Act of April 19, 1945, 59 Stat. 53. Subsequently, the Arkansas River Compact was ratified by the State of Colorado by the Act of February 19, 1949, Colo. Rev. Stat. 1963, § 149-9-1; the State of Kansas ratified the Compact by the Act of March 7, 1949, Kansas Gen. Stat. Ann. 1964, § 82a-520. The Compact was approved and enacted into federal law by the Act of Congress of May 31, 1949, 63 Stat. 145. A copy of the Arkansas River Compact was attached as Appendix A to the original Complaint in this action.

4. The principal purpose of the Arkansas River Compact was to "[e]quitably divide and apportion . . . the waters of the Arkansas River and their utilization as well as the benefits arising from the construction, operation and maintenance by the United States of John Martin Reservoir Project for water conservation purposes." 63 Stat. 145, 145, art. I.

5. While expressly recognizing the possibility of offsetting postcompact development of the waters of the Arkansas River by new regulation or increased efficiency, the Compact mandates "that the waters of the Arkansas River, as defined in Article III, shall not be materially depleted in usable quantity or availability for use to the

water users in Colorado and Kansas . . . by such future development or construction." 63 Stat. 145, 147, art. IV(D).

6. The Compact provides that "Colorado shall administer the decreed rights of water users in Colorado Water District 67 as against each other and as against all rights now or hereafter decreed to water users diverting upstream from John Martin Dam on the basis of relative priorities. . . ." 63 Stat. 145, 148, art. V(F).

7. Through the actions of its officers, agents and political subdivisions, the State of Colorado and its water users have materially depleted the usable and available stateline flows of the Arkansas River since the adoption of the Compact.

8. In spite of its duties and obligations under the Compact, since 1949 the State of Colorado has allowed and permitted substantial increases in the diversion and use in Colorado of the surface and hydrologically related ground waters of the Arkansas River, without the concomitant regulatory or conservation measures that the Compact requires to protect the states against material depletions in usable stateline flows.

9. The lack of effective administrative practices in Colorado has encouraged rather than retarded the development of postcompact depletions of the waters of the Arkansas River Basin and has resulted in ongoing, material depletions of the usable flows of the Arkansas River and substantial and irreparable injury to Kansas water users.

10. For more than twenty years, the State of Colorado has investigated and known the impact of the ground water appropriations in the Arkansas River Basin in Colorado. Approximately 150,000 acre feet per year of ground water related to the Arkansas River has been appropriated in Colorado since 1949, and the State of Colorado has intentionally disregarded the findings of its investigations to the effect that such appropriations directly and materially reduce the usable flow and availability of the Arkansas River in Colorado and Kansas. By its acquiescence in the postcompact proliferation of ground water diversions and its failure to administer the priorities of postcompact ground water diversions with existing surface diversions, Colorado has breached and continues to breach its obligations and responsibilities under the Arkansas River Compact.

11. Since the adoption of the Compact, the State of Colorado has attempted to unilaterally impede the bilateral action of the Compact Administration intended to protect Kansas' Compact apportionment and has failed to apply and administer its internal laws in order to meet its obligations under the Compact.

12. Pursuant to Article VIII(H), the Arkansas River Compact Administration has conducted an investigation of alleged Compact violations. The State of Colorado, however, through its Compact Commissioner, has rejected and continues to reject the State of Kansas' requests to investigate the impact on the Arkansas River of: 1) Colorado's substantial, postcompact ground water depletions of surface flows at the stateline; 2) the failure of Colorado to administer ground water priorities against surface priorities; 3) Colorado's artificially transferring

water from the storage pool in Trinidad Reservoir to the sediment pool and then refilling the storage pool to the detriment of downstream users; 4) the consequences of future increases in the consumption of Colorado's transmountain return flows; and 5) Colorado's unilateral rejection of the Arkansas River Compact Administration's Resolution of July 24, 1951, requiring that any reregulation of the native water of the Arkansas River be approved by the Compact Administration. Additionally, the State of Colorado refuses to enjoin its postcompact ground water appropriations and resulting surface depletions during the pendency of investigation of the effects of such appropriations, in spite of the irrefutable fact that those appropriations materially deplete the usable and available flows of the Arkansas River. Accordingly, the State of Colorado has used and will continue to use the pending administrative investigation as the basis for prolonging the substantial and irreparable injury to the State of Kansas by wrongfully depriving the State of Kansas and its citizens of the waters of the Arkansas River to which they are entitled under the Compact.

13. The State of Colorado has failed and continues to fail to make deliveries of releases to which Kansas is entitled from John Martin Reservoir by an equivalent in stateline flow, as required by Article V(E)3 of the Compact, and in violation of Articles V(E)4 and V(H)2.

14. Grave and irreparable injury to the State of Kansas and its citizens who were entitled to receive and use the water apportioned to them by the Arkansas River Compact has been caused by the acts and conduct of the State of Colorado, its officers, citizens, and political subdivisions in failing, neglecting, and refusing to deliver

water to Kansas in the usable and available quantities apportioned to it by the Compact.

15. Grave and irreparable injury will be suffered in the future by the State of Kansas and its citizens unless relief is afforded by this Court to prevent the State of Colorado, its officers, citizens, and political subdivisions from using and withholding water which Kansas is entitled to and which Colorado has heretofore agreed to deliver pursuant to the terms and provisions of the Arkansas River Compact.

16. The State of Kansas has sustained damages as follows:

(a) General damages arising from breach of the Arkansas River Compact by the State of Colorado, consisting of the value of Kansas' apportioned share of the Arkansas River lost to Kansas as a result of Colorado's depletions of the Arkansas River resulting from its violations of the Arkansas River Compact in an amount to be proved at trial.

(b) Special damages arising from breach of the Arkansas River Compact by the State of Colorado consisting of depletions of the Ogallala aquifer, a non-renewable resource, in the State of Kansas, resulting from Colorado's violations of the Arkansas River Compact in an amount to be proved at trial.

17. The State of Kansas has no effective remedy to enforce its rights under the Arkansas River Compact against the State of Colorado other than through the exercise of original jurisdiction in this case.

WHEREFORE, the State of Kansas respectfully prays that the Court issue its decree commanding the State of Colorado, its officers, citizens, and political subdivisions to deliver the waters of the Arkansas River in accordance with the provisions of the Arkansas River Compact and providing for such other and further relief as the Court may deem appropriate; and WHEREFORE, the State of Kansas prays that the Court award all general and special damages resulting from violations of the Arkansas River Compact by the State of Colorado, and for all other relief that the Court deems just and proper.

Respectfully submitted,

ROBERT T. STEPHAN
Attorney General of Kansas

JOHN W. CAMPBELL
Deputy Attorney General

LELAND E. ROLFS
Assistant Attorney General

/s/ Richard A. Simms
RICHARD A. SIMMS
Special Assistant Attorney General
Counsel of Record

JAY F. STEIN
Special Assistant Attorney General

Simms & Stein, P.A.
First Northern Plaza
121 Sandoval Street
Post Office Box 280
Santa Fe, New Mexico 87504
(505) 983-3880

CERTIFICATE OF SERVICE

I, Richard A. Simms, hereby certify that I caused a copy of the foregoing Kansas' First Amended Complaint to be served by federal express this 10th day of November, 1989 to:

The Honorable Arthur L. Littleworth
Special Master, United States Supreme Court
Best, Best & Krieger
3750 University Avenue
Riverside, California 92502

The Honorable Roy Romer
Governor of Colorado
State Capitol 136
Denver, Colorado 80203

The Honorable Duane Woodard
Attorney General of Colorado
1525 Sherman St. 300
Denver, Colorado 80203

David Robbins, Esquire
Hill and Robbins
100 Blake Street Building
1441 Eighteenth Street
Denver, Colorado 80202

Honorable Charles Fried
Solicitor General
Department of Justice
Washington, D.C. 20530

Patricia L. Weiss, Esquire
U.S. Department of Justice
Land and Natural Resources Division
P.O. Box 663
Washington, D.C. 20044-0663

Andrew F. Walch, Esquire
United States Department of Justice
Land & Natural Resources Division
1961 Stout Street
Post Office Drawer 3607
Denver, Colorado 80294

/s/ Richard A. Simms
Richard A. Simms
Special Assistant Attorney General
Counsel of Record

APPENDIX – Exhibit 3

Colorado's Answer to the First Amended Complaint and Counterclaim, filed November 27, 1989

IN THE SUPREME COURT OF THE UNITED STATES
No. 105, Original
October Term 1985

STATE OF KANSAS,

Plaintiff,

v.

(Filed Nov. 27, 1989)

STATE OF COLORADO,

Defendant,

and

UNITED STATES OF AMERICA,

Defendant-Intervenor.

COLORADO'S ANSWER TO THE FIRST AMENDED COMPLAINT AND COUNTERCLAIM

ANSWER

Defendant, the State of Colorado, for its answer to the First Amended Complaint filed in the above-captioned action by Plaintiff, the State of Kansas, states:

1. Colorado admits the Court has jurisdiction under the allegations in paragraph 1 of the First Amended Complaint. Colorado denies that this is an appropriate case for the Court to exercise such jurisdiction because Kansas has failed to exhaust its administrative remedies under Article VIII of the Arkansas River Compact.

2. Colorado admits the allegations in paragraph 2 of the First Amended Complaint.

3. Colorado admits the allegations in paragraph 3 of the First Amended Complaint.

4. Colorado admits that one of two major purposes of the Arkansas River Compact is quoted in paragraph 4 of the First Amended Complaint. Colorado denies the allegations of paragraph 4 insofar as they assert that the purpose set forth in Article I-B of the Compact is the "principal" purpose of the Arkansas River Compact.

5. Colorado admits that a portion of Article IV-D of the Compact is quoted in paragraph 5 of the First Amended Complaint. Colorado denies the allegations of paragraph 5 insofar as they assert Kansas' interpretation of Article IV-D.

6. Colorado admits that a portion of the first sentence of Article V-F of the Arkansas River Compact is quoted in paragraph 6 of the First Amended Complaint. The first sentence of Article V-F in its entirety reads as follows:

> In the event the Administration finds that within a period of fourteen (14) days the water in the conservation pool will be or is liable to be exhausted, the Administration shall forthwith notify the State Engineer of Colorado, or his duly authorized representative, that commencing upon a day certain within said fourteen (14) day period, unless a change of conditions justifies cancellation or modification of such notice, Colorado shall administer the decreed rights of water users in Colorado Water District 67 as against each other and as against all rights now or hereafter decreed to water users diverting upstream from John Martin Dam on the basis of relative priorities in the same manner in which

> their respective priority rights were administered by Colorado before John Martin Reservoir began to operate and as though John Martin Dam had not been constructed.

Colorado affirmatively alleges that the Arkansas River Compact Administration by resolution in 1980 adopted an operating plan for John Martin Reservoir which modifies the method by which the Administration finds that the water in the conservation pool is exhausted for the purposes of Article V-F.

7. Colorado denies the allegations in paragraph 7 of the First Amended Complaint.

8. Colorado denies the allegations in paragraph 8 of the First Amended Complaint.

9. Colorado denies the allegations in paragraph 9 of the First Amended Complaint.

10. Colorado admits that for more than twenty years its agencies or officials have investigated ground water appropriations in the Arkansas River Basin in Colorado. Colorado denies the remaining allegations of paragraph 10 of the First Amended Complaint.

11. Colorado denies the allegations in paragraph 11 of the First Amended Complaint.

12. Colorado admits that the Arkansas River Compact Administration was in the process of conducting an investigation of alleged Compact violations pursuant to Article VIII-H of the Arkansas River Compact at the time Kansas commenced this proceeding on December 16, 1985, and that Colorado refused to enjoin all post-compact ground water appropriations in Colorado during the

pendency of the investigation. Colorado admits that the Colorado representatives to the Arkansas River Compact Administration rejected requests by the Kansas representatives to investigate the consequences of possible future increases in the consumption of Colorado's "transmountain" return flows. Colorado denies the remaining allegations of paragraph 12 of the First Amended Complaint.

13. Colorado denies the allegations in paragraph 13 of the First Amended Complaint.

14. Colorado denies the allegations in paragraph 14 of the First Amended Complaint.

15. Colorado denies the allegations in paragraph 15 of the First Amended Complaint.

16. Colorado denies the allegations in paragraph 16 of the First Amended Complaint.

17. Colorado denies the allegations in paragraph 17 of the First Amended Complaint.

AFFIRMATIVE DEFENSES

1. Kansas failed to exhaust its administrative remedies under Article VIII of the Arkansas River Compact.

2. Kansas' claims against Colorado are barred by accord and satisfaction, failure to mitigate damages, laches, estoppel, waiver, statute of limitations, or the doctrine of unclean hands.

3. To the extent post-compact developments were beyond the control of the State of Colorado, Colorado is not liable for those acts.

4. Article V-E(5) of the Arkansas River Compact provides there shall be no allowance or accumulation of credits or debits for or against either state.

5. With regard to Kansas' claim that Colorado and its water users have materially depleted the usable and available stateline flows of the Arkansas River since the adoption of the Compact to the injury of water users in Kansas under the Compact, Colorado asserts that irrigation in the Arkansas River basin in Colorado has declined since the adoption of the Compact and that acreage under irrigation in western Kansas has increased at least five-fold in the same period, from approximately 65,000 acres in 1948 to 350,000 acres in 1980. Kansas seeks to have this Court rewrite the Arkansas River Compact to impose a new stateline delivery obligation on Colorado so as to maintain a post-compact well economy in western Kansas, all at the expense of Colorado water users, contrary to the express terms of the Compact.

6. Waters brought into the Arkansas River basin from other river basins are not apportioned to Kansas under the Arkansas River Compact and Kansas has no claim or right to such waters.

7. In 1980, the Arkansas River Compact Administration approved an operating plan for John Martin Reservoir pursuant to which water stored in the conservation pool of the reservoir is transferred into separate storage accounts for Kansas and ditches in Colorado Water District 67 at agreed upon rates and is apportioned into the accounts in agreed upon percentages. Based upon a series of agreements among Colorado users, after water stored

in the conservation pool is fully transferred to the separate storage accounts, but not necessarily released from the reservoir, Colorado reverts to administration of decreed priorities and the decreed rights of water users in Colorado Water District 67 are administered as against rights decreed to water users diverting upstream from John Martin Dam on the basis of relative priorities in the same manner as though John Martin Dam had not been constructed. The Colorado representatives approved the operating plan in 1980 and have allowed the operating plan to remain in effect from year-to-year thereafter, to the substantial benefit of Kansas water users, based upon the aforesaid agreements among Colorado water users to determine when a "call" by ditches in Colorado Water District 67 will be enforced above John Martin Reservoir. Those agreements were in turn based on an agreement to permit storage of historical direct-flow winter diversions upstream from John Martin Reservoir. Kansas has accepted the benefits of the 1980 operating plan and agreed to its terms with knowledge of the agreements among Colorado water users and with knowledge that the 1980 operating plan would change the regimen of the Arkansas River. Therefore, by having accepted the benefits of the 1980 operating plan, Kansas is barred from asserting that any reregulation of the native waters of the Arkansas River be approved by the Compact Administration based upon the Administration's Resolution of July 24, 1951.

8. With regard to Kansas' allegation that Colorado, through its Compact "Commissioner", has rejected and

continues to reject Kansas' requests to investigate Colorado's "unilateral rejection" of the Arkansas River Compact Administration's Resolution of July 24, 1951, Colorado denies that the Resolution has any binding effect on Colorado. In the alternative, the Resolution was amended by the Administration on January 4, 1982. Further, Kansas failed to raise an objection to the winter storage program in Pueblo Reservoir for six years after it began operation in 1975 with the full knowledge of Kansas and the Administration.

COUNTERCLAIM

Defendant, the State of Colorado, by its Attorney General, asserts the following counterclaim against Plaintiff, the State of Kansas:

1. The Court has jurisdiction of this counterclaim under Article III, Section 2, Clause 2 of the Constitution of the United States, and Paragraph (a), Subsection (1), Section 1251, Title 28 of the United States Code.

2. The Arkansas River is an interstate stream which rises in the Rocky Mountains near Leadville, Colorado, then flows southeasterly to Salida, Colorado, then east through Canon City to Pueblo, Colorado, then across the plains of eastern Colorado into the State of Kansas.

3. In order to settle existing disputes and to remove causes of future controversy concerning the waters of the Arkansas River and to equitably divide and apportion between the States of Colorado and Kansas the waters of the Arkansas River, as well as the benefits arising from the construction, operation, and maintenance of John Martin Reservoir for water conservation purposes, the States of

Colorado and Kansas ratified the Arkansas River Compact, which Compact was approved by the United States Congress by Act of May 31, 1949, 63 Stat. 145.

4. Article V-E(2) of the Arkansas River Compact provides: "Water released upon concurrent or separate demands shall be applied promptly to beneficial use unless storage thereof downstream [from John Martin Reservoir] is authorized by the [Arkansas River Compact] Administration."

5. On information and belief, the state officials charged with administration of water rights in Kansas have allowed water released from John Martin Reservoir upon demand by Kansas under Article V of the Arkansas River Compact to be stored downstream in Lake McKinney in Kansas rather than being applied promptly to beneficial use, in violation of the provisions of Article V-E(2) of the Compact.

6. Subsequent to the approval of the Arkansas River Compact by the United States Congress in 1949, state officials charged with the administration of water rights in Kansas have allowed the construction of wells and have permitted ground water appropriations in Kansas that have materially depleted the usable quantity or availability for use to the surface water users in Kansas under the Compact. Those depletions caused Kansas to make additional demands for releases of water stored in John Martin Reservoir pursuant to the Compact to the detriment of water users in Colorado.

7. Irreparable injury to the State of Colorado and water users in Colorado under the Compact has been caused by the acts and conduct of the State of Kansas, its officers, and citizens in permitting the use of the waters

of the Arkansas River in violation of the terms of the Compact.

WHEREFORE, having fully answered and having asserted its affirmative defenses and counterclaim, Colorado prays that the Court grant judgment for Colorado and against Kansas on the claims of Kansas, that the Court issue its decree compelling the State of Kansas, its officers, and citizens to comply with the provisions of the Arkansas River Compact, that Colorado have and recover its reasonable costs, and for such other and further relief as the Court may deem proper under the circumstances.

DUANE WOODARD
Attorney General of Colorado

CHARLES B. HOWE
Chief Deputy Attorney General

RICHARD H. FORMAN
Solicitor General

HILL & ROBBINS, P.C.

/s/ David W. Robbins
DAVID W. ROBBINS
Special Assistant Attorney General
Counsel of Record
DENNIS M. MONTGOMERY
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Attorneys for Defendant
State of Colorado

CERTIFICATE OF SERVICE

I, David W. Robbins, hereby certify that I am a member of the Bar of this Court and Counsel of Record for the State of Colorado and that on the 22nd day of November, 1989, I caused a true and correct copy of Colorado's Answer and Counterclaim to Kansas' First Amended Complaint to be placed in the United States mail, first class postage prepaid, addressed as follows:

The Honorable Arthur L. Littleworth
(original and one copy)
Special Master
Best, Best & Krieger
3750 University Avenue
Riverside, California 92502

Richard A. Simms, Esq.
Simms & Stein
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Patricia Weiss, Esq.
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/s/ David W. Robbins
DAVID W. ROBBINS
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Counsel of Record

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Denver, Colorado 80202
Telephone: 303-296-8100

Attorneys for Defendant
State of Colorado

APPENDIX – Exhibit 4

Answer of the United States to the First Amended Complaint, filed January 15, 1990

No. 105 Original

IN THE
SUPREME COURT OF THE UNITED STATES
OCTOBER TERM 1989

BEFORE THE HONORABLE
ARTHUR L. LITTLEWORTH,
SPECIAL MASTER

STATE OF KANSAS, PLAINTIFF

v.

STATE OF COLORADO, ET AL.

ANSWER OF THE UNITED STATES TO THE FIRST AMENDED COMPLAINT

(Filed Jan. 15, 1990)

KENNETH W. STARR
Solicitor General

RICHARD B. STEWART
Assistant Attorney General

PATRICIA L. WEISS
ANDREW F. WALCH
Attorneys

Department of Justice
Washington, D.C. 20530
(202) 633-2217

IN THE
SUPREME COURT OF THE UNITED STATES
OCTOBER TERM 1989

BEFORE THE HONORABLE
ARTHUR L. LITTLEWORTH,
SPECIAL MASTER

No. 105 Original

STATE OF KANSAS, PLAINTIFF

v.

STATE OF COLORADO, ET AL.

ANSWER OF THE UNITED STATES TO THE FIRST AMENDED COMPLAINT

The United States, in response to the First Amended Complaint of the State of Kansas, states:

1. The averments of paragraph 1 are conclusions of law to which no response is required.

2-3. The averments of paragraphs 2 and 3 are admitted.

4. The United States admits that one of the purposes of the Arkansas River Compact is as quoted in paragraph 4 of the complaint, and avers that the Compact itself is the best evidence of its contents. Act of May 31, 1949, 63

Stat. 145. The remaining averment of paragraph 4 is a conclusion of law to which no response is required.

5. The United States admits that the portion of Art. IV(D) of the Arkansas River Compact is as quoted in paragraph 5 of the complaint and avers that the Compact itself is the best evidence of its contents. The remaining averments of paragraph 5 are conclusions of law to which no response is required.

6. The United States admits that the portion of Article V(F) of the Arkansas River Compact is as quoted in paragraph 6 of the complaint and avers that the Compact itself is the best evidence of its contents. The United States avers that the Arkansas River Compact Administration by resolution in 1980 adopted an operating plan for John Martin Reservoir which modifies the method by which the Administration finds that the water in the conservation pool is exhausted for the purposes of Article V(F) of the Compact.

7-11. The United States is without knowledge or information sufficient to form a belief as to the truth of the averments of paragraph 7-11 of the complaint.

12. The United States admits the averments of the first sentence of paragraph 12 and that the State of Colorado, through its Compact Commissioner, has at various times declined to approve investigations of the impact on the Arkansas River of certain of the matters itemized in paragraph 12. The United States is without knowledge or information sufficient to form a belief as to the truth of the remaining averments of paragraph 12.

13-17. The United States is without knowledge or information sufficient to form a belief as to the truth of the averments of paragraphs 13-17 of the complaint.

AFFIRMATIVE DEFENSES

1. The Trinidad Project is a multi-purpose project constructed and operated by the United States Army Corps of Engineers in accordance with federal laws and operating principles developed by the Bureau of Reclamation and approved by the States of Colorado and Kansas. Pursuant to a request by the Arkansas River Compact Administration, the United States Bureau of Reclamation has undertaken a review of the Trinidad Project operating principles and has issued a final report recommending certain modifications of the operating principles. Adoption of the Bureau of Reclamation's report by the Arkansas River Compact Administration and implementation of the recommendations contained in the report to insure that the waters of the Arkansas River shall not be materially depleted in usable quantity or availability for use by the water users in Colorado and Kansas will moot plaintiff's claims with respect to the Trinidad Project.

2. Pueblo Dam and Reservoir are features of the Fryingpan-Arkansas Project, a multipurpose project authorized by Congress in 1962 in "substantial accordance with the engineering plans" set forth in House Document 83-187. Act of August 16, 1962, 76 Stat. 389, as amended by Act of October 27, 1974, 88 Stat. 1486, 1497, and Act of November 3, 1978, 92 Stat. 2493. The engineering plans set forth in H.R. Doc. No. 83-187 include a winter storage program at Pueblo Reservoir. Accordingly,

with respect to any claim that the winter storage program at Pueblo Reservoir should have been submitted to the Arkansas River Compact Administration for approval, the complaint fails to state a claim upon which relief may be granted, for the winter storage program is a Congressionally authorized feature of the Fryingpan-Arkansas Project.

3. The winter storage program has been in place at Pueblo Reservoir since 1976, with the knowledge of the Arkansas River Compact Administration, and the repayment contract for the Project between the United States and the Southeastern Colorado Water Conservancy District contains specific provisions for the storage of winter water. Accordingly, plaintiff's claim that the winter storage program should have been submitted to the Arkansas River Compact Commission for approval is barred by the equitable doctrine of laches.

WHEREFORE, the United States respectfully prays that the Court issue an order protecting the rights of the United States in the Trinidad Project and the Fryingpan-Arkansas Project, and for such other and further relief as the Court may deem just and proper.

Respectfully submitted.

KENNETH W. STARR
Solicitor General

RICHARD B. STEWART
Assistant Attorney General

PATRICIA L. WEISS
ANDREW F. WALCH
Attorneys

JANUARY 1990

IN THE SUPREME COURT OF THE UNITED STATES
OCTOBER TERM, 1989

STATE OF KANSAS Plaintiff, v. STATE OF COLORADO Defendant, vs. and UNITED STATES OF AMERICA Defendant-Intervenor	)	No. 105, Original

CERTIFICATE OF SERVICE
(Filed Jan. 15, 1990)

It is hereby certified that all parties required to be served have been served copies of the ANSWER OF THE UNITED STATES TO THE FIRST AMENDED COMPLAINT, by first-class mail, postage prepaid, this 12th day of January, 1990.

[SEE ATTACHED SERVICE LIST]

/s/ Kenneth W. Starr
KENNETH W. STARR
SOLICITOR GENERAL

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1441 18th St., Ste. 100
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The Honorable Arthur L. Littleworth
Special Master
United States Supreme Court
Best, Best & Krieger
3750 University Ave.
Riverside, CA 92502

The Honorable Roy Romer
Governor of Colorado
State Capitol 136
Denver, CO 80203

APPENDIX – Exhibit 5

Decision of Special Master on Colorado Motion to Stay,
filed October 21, 1988

IN THE SUPREME COURT OF THE UNITED STATES

STATE OF KANSAS,	)	
Petitioner,	)	
	)	No. 105, Original
v.	)	October Term,
	)	1985
STATE OF COLORADO,	)	
Respondent.	)	
	)	

DECISION OF SPECIAL MASTER ON COLORADO MOTION TO STAY

(Filed Oct. 21, 1988)

Colorado filed a Motion to Stay Based on Kansas' Failure to Exhaust Its Administrative Remedies. The Motion dealt with two of the several issues in the Complaint: i.e., post-Compact well development in Colorado, and the operation of Trinidad Reservoir. The Motion was fully briefed, and oral argument was held in the Federal Court of Appeal in Pasadena, California on September 28, 1988. David W. Robbins, Esq. argued the Motion for Colorado, and Richard A. Simms responded for Kansas.

Kansas acknowledges that it has an obligation, before seeking judicial relief, to exhaust its administrative remedies under the Arkansas River Compact. The Compact was ratified by the respective legislatures of each state, and approved by Congress in 1949. (Act of May 31, 1949, 63 Stat. 145) The Compact Administration is similar to that discussed in *State of Texas vs. State of New Mexico* (1983) 462 U.S. 554, 77 L.Ed.2d 1; 103 S.Ct. 2558. The Administration consists of three representatives from each state, but each state ". . . shall have but one vote in

the Administration and every decision, authorization or other action shall require unanimous vote." (Article VIII-D) While a representative of the United States chairs the Administration, he has no vote. (Article VIII-C)

Only two specific remedies for alleged Compact violations are provided for in the Compact. It provides that violations shall be "promptly investigated" by the Administration, although the procedure for the investigation and any remedies still require agreement between the states. (Article VIII-H) In addition, disputes "may," by unanimous vote, be referred for arbitration. (Article VIII-D) Both parties agree that the exhaustion test under the circumstances involved here is whether a state has made a "reasonable effort" to proceed first through the Compact Administration. Colorado also acknowledges that it is proper to seek judicial relief if an investigation by the Administration reaches an impasse. (Colo. Br., p. 21) Colorado, as part of its Motion, filed four large volumes of Appendix documents, going back several years, which appear to include the Compact Administration record with respect to post-Compact well development and the operations of Trinidad Reservoir. Both parties relied upon this record in their briefs and arguments.

Kansas argues first that the exhaustion issue was actually decided by the United States Supreme Court when it authorized the filing of Kansas' Complaint. Kansas moved to file its Complaint on December 16, 1985, alleging that the State of Colorado and its water users had materially depleted the usable and available stateline flows of the Arkansas River in violation of the Compact.

Kansas further alleged that Colorado had blocked Kansas' efforts to have the Compact Administration investigate its complaints.

On February 18, 1986, Colorado filed a brief in opposition to Kansas' Motion for Leave to File Complaint. The thrust of that brief was that Kansas had not made a "reasonable effort" to resolve its complaints through the Compact Administration, and that absent such an effort, the Supreme Court should decline to hear the matter. (p. 1) Colorado stated that the question presented was whether Kansas had met its burden " . . . to demonstrate that a pending investigation of the Arkansas River Compact Administration is not an adequate means to vindicate its allegations of Compact violations." (p. 3) In its brief, citing certain documentary evidence, Colorado alleged that there was a "pending investigation" by the Compact Administration, that the Administration was not deadlocked or unable to act, and that Colorado had not refused to investigate Kansas' allegations. (pp. 8-9) However, Colorado did not file with the Supreme Court the same voluminous administrative record used to support its Motion before the Special Master.

In response to Colorado's brief, Kansas on March 3, 1986 filed a new motion in the alternative, either for leave to file its complaint, or to compel an investigation by the Compact Administration pursuant to Article VIII-H. In its supporting brief, Kansas outlined in further detail its view of efforts taken within the Compact Administration, and the alleged frustration of the administrative procedure. Thus, the question of whether the administrative process had been properly exhausted was clearly an issue in the pleadings before the Supreme Court.

The Supreme Court's Order stated simply:

> "The motion for leave to file a bill of complaint is granted. Defendant is allowed sixty days within which to file an answer."

Kansas contends that the Court made a choice between the alternatives presented in its Motion, and thereby disposed of the exhaustion issue. Colorado, on the other hand, argues that the Court's silence is not a basis for inferring intent, and had the Court intended to decide the exhaustion issue, it would have ordered argument and decided the issue explicitly.

The requirement of a motion for leave to file a complaint and the requirement of a brief in opposition do enable the Supreme Court to dispose of matters at a preliminary stage. (*Ohio v. Kentucky* (1973) 410 U.S. 641, 644) As the Court has explicitly recognized, its objective in original cases is to have the parties, as promptly as possible, reach and argue the merits of the controversy presents. (*Id.*) To this end, the Court has strongly suggested that granting an original plaintiff's motion for leave to file complaint amounts to a rejection of arguments that the case should be dismissed. (*Maryland, et al. v. State of Louisiana* (1981) 451 U.S. 725, 740, fn. 16) Further, in the analogous case of *Texas v. New Mexico* (1983) 462 U.S. 554, the Court intimated that "fundamental structural considerations," such as an interstate compact that accords each signatory state the power to veto authoritative commission action, may abbreviate inquiry into the question of whether an available remedy exists at the administrative level. (462 U.S. 54, 568-570)

It is not necessary, however, to decide Colorado's present Motion on the basis of the Supreme Court order. The Special Master is convinced that Kansas did make a reasonable effort to pursue its complaints through the Compact Administration, but because of the inherent limitations in that procedure, the parties reached an impasse. Indeed, the briefs and oral argument on the Motion dealt primarily with the substance of the efforts before and by the Compact Administration, and not upon the Supreme Court order.

First, with respect to post-Compact well development, Kansas cites numerous law reviews and other secondary sources to show that unregulated well development, and its impact on surface water users, has been a problem for many years. (Kan. Br., pp. 30-31) By 1983 Kansas began its own study of the decline in flows of the Arkansas River, and the development of upstream wells in Colorado as a possible cause. Completed in 1984, that study concluded that for the period 1974 to 1981 a conservative estimate of the stateline depletions due to post-Compact wells in Colorado was 40,000 to 50,000 acre-feet per year. (Appendix Exh. 21, p. iii) Colorado and the Compact Administration were aware of that study. Nonetheless, Colorado contends that Kansas did not formally seek a Compact investigation of this issue until February of 1985. (Colo. Closing Br., pp. 21, 27) Assuming that to be true for purposes of this Motion, there is no question that on March 28, 1985 the Compact Administration directed a formal investigation of the depletion of stateline flows. A number of potential causes were to be investigated, including specifically "well development of the waters of the Arkansas River in Colorado," as well as

"the operation of the Trinidad Dam and Reservoir project." (Appendix Exh. 28, attached Exh. L)

The Compact Administration Resolution directed that the investigation be undertaken by a committee consisting of the Director of the Colorado Water Conservation Board and the Chief Engineer of Kansas, or their respective designees. Thus, the same unanimity requirements that limited the Administration itself were carried over into the structure of this investigation. Finally, the March 28 Resolution called for the investigation to be completed by the next annual meeting of the Compact Administration on December 10, 1985.

The engineers for the two states met promptly, but were unable initially to agree upon a scope of work for the investigation. (Appendix Exh. 29) At their next meeting they agreed to defer consideration of a complete scope of work, and defined instead a preliminary scope that included the compilation of certain data and construction of a series of mass diagrams. (Appendix Exh. 30, p. 2) The mass diagrams were presented at their meeting on July 12, 1985, but again the two engineers were unable to agree "about what the diagrams did or did not show." (Appendix Exh. 32, p. 4) Finally they decided to prepare and exchange separate reports analyzing the mass curves, and recommended that the Compact Administration hold a special meeting on October 8, 1985 to receive such report as the committee might be ready to make. (*Ibid.*) The committee met once again on September 17, ". . . but was unable to agree on the conclusions to be drawn from the single and double mass diagrams and on what further investigation, if any, should be undertaken." (Appendix

Exh. 34, pp. 4) J. William McDonald, the Colorado representative on the committee, reported to the Compact Administration that the committee had "reached an impasse" at its September 17 meeting. (Appendix Exh. 36, p. 2)

Against this background, the Compact Administration met on October 8, 1985. The Colorado representative acknowledged that there had been a "substantial decline in usable stateline flows starting in 1974." (Appendix Exh. 36, p. 4) However, he did not see post-Compact well development as the cause. He stated:

> "It seems to me that all the engineering shows thus far is that there has been a decline in usable stateline flows starting in 1974, which corresponds it appears to me, to a decline in tributary inflow rather than to well development or any other beneficial development in the Arkansas River basin in Colorado." (Appendix Exh. 37, p. 32)

Colorado therefore took the position that the investigation should first examine neither the well issue nor the operations of Trinidad Reservoir, but (1) reduced diversions by ditches in Colorado Water District 67; (2) the operating plan for John Martin Reservoir; (3) decreased plains precipitation; and (4) soil conservation measures. (Appendix Exh. 37, p. 35)

With respect to well development, the Colorado representative stated:

> "In that context I do not believe it is appropriate to launch an investigation of well pumping in Colorado as David (David Pope, Kansas State Engineer) has urged in his second report until

> we have determined whether the declines in usable stateline flows might be the result of other causes, which I believe to be more likely than the causes which David has addressed. . . . And it has been my position therefore that the investigation should indeed continue, but it should start first with those factors which at this point in time appear to be most likely explanations for the decline in usable stateline flows." (Appendix Exh. 37, pp. 31-32)

Kansas, on the other hand, urged that the investigation proceed to examine ten possible causes for the decline in stateline flows, including all those suggested by Colorado, and including well development and the operations of Trinidad Reservoir. (Appendix Exh. 37, pp. 35-36) The Compact Administration finally adopted a Resolution that the committee continue its investigation only of those matters mutually agreed upon, that is, the four items suggested by Colorado. (Appendix Exh. 37, pp. 37-38)

Colorado now argues that it did not "rule out" an investigation of the impact of post-Compact wells on stateline flows, but neither did it commit that Kansas' complaints would ever be investigated. (Colo. Closing Br., p. 28; Appendix Exh. 37, p. 33) The facts are that in March the Compact Administration directed an investigation of post-Compact well development and the operations of Trinidad Reservoir, as possible causes among others for the decline in stateline flows. The investigation was to have been completed within the year. Yet by October, at Colorado's insistence, those two matters had been dropped from the committee's investigation agenda. Kansas had a right to have its complaints "promptly

investigated" and not sidetracked by Colorado's belief that other factors might have more likely caused the decline in stateline flows. (Article VIII-H)

The well issue came up again at the Compact Administration's annual meeting on December 10, 1985. Kansas asked Colorado directly whether it would be ". . . willing to immediately begin a prompt and expeditious investigation of post-Compact alluvial well development in the Arkansas River Basin in Colorado. (Appendix Exh. 39, p. 107) Kansas never received an affirmative reply.

At that meeting, Kansas also presented a report from the nationally known consulting firm of S. S. Papadopulos & Associates. The report concluded that the investigation methodology proposed by Colorado, namely, focusing first on separate factors like climatic conditions, would not "produce meaningful conclusions regarding the alleged violations"; that the various possible factors must be examined contemporaneously, "regardless of preconceived notions as to the relative effects of any one factor"; and that studies had demonstrated that groundwater development and reservoir regulation "impact significantly the streamflow conditions within the river system," and "must be included" in order properly to investigate Kansas' allegation. (Appendix Exh. 39, Exh. E, pp. 5-6)

Kansas filed its motion with the Supreme Court six days later on December 16, 1985, having previously announced after the October 8 meeting that the States were at an impasse, and that such an action was being prepared. (Appendix Exh. 38)

Turning now to the operations of Trinidad Reservoir, Colorado concedes that Kansas first complained about this issue in 1980. (Colo. Br. pp. 9, 24) Through an administrative practice known as "rollover," Kansas alleged that additional water was stored in Trinidad Reservoir, in violation of the Compact. The Administration found that the amount involved for 1979 was 18,290 acre-feet. (Appendix Exh. 13) At a Compact Administration meeting in 1980, Kansas sought to have the Administration recommend that the State Engineer of Colorado order the release of such stored water, but Colorado voted "no." (Appendix Exh. 13, Colo. Br. p. 9) The rollover practice was continued, and Kansas contends that by 1982 some 58,514 acre-feet of water had been illegally stored. (Kansas' Response, p. 27) Admittedly, Kansas sought arbitration of this issue in 1982, in 1983 and again in 1985. (Appendix Exh. 16, pp. 78, 87; Exh. 28, pp. 168-170) Colorado declined, due to the "failure of the State of Kansas to identify the underlying factual basis for its claims." (Appendix Exh. 16, pp. 88, 85)

In 1983, therefore, Kansas undertook its own study, hiring Simons, Li & Associates, Inc. That study was completed in February, 1984 and concluded in part:

> "Since 1979, the Trinidad Project has been operated in a manner different than that envisioned by the Bureau of Reclamation and that approved by the Compact Administration. It is estimated that these deviations in the Trinidad Project operation have caused an additional 26,000 to 35,000 acre-feet of depletions to downstream water users." (Appendix Exh. 21, p. iii)

As previously indicated, the Trinidad issue was finally included as part of the investigation authorized by the Compact Administration on March 28, 1985. However, like the well development issue, Trinidad was dropped on October 8, 1985.

Colorado's principal argument with respect to Trinidad Reservoir is that reservoir operations are currently being reviewed and analyzed by the United States Bureau of Reclamation. Colorado claims that the Bureau's study, which was begun in 1984, embraces all of Kansas' complaints. The study was requested by the Compact Administration following the Simons, Li report, but was also independently required as part of a five-year review procedure. The Bureau's final report is expected at any time. Two draft reports have been issued earlier, and Kansas maintains that there are both "methodological and legal objections" to the last draft. (Kansas Response, p. 29) However, the scope and efficacy of the Bureau's study are not the issue. There is nothing to show that a routine, though timely, study by the Bureau constitutes a Compact investigation. Indeed, the Compact administration presumably would not have included the operations of Trinidad Reservoir within its March 28, 1985 investigation if the Bureau's study had been intended to serve that function. The Bureau's study may provide valuable data on the issue, but it is not a substitute for action by the Compact Administration to investigate Kansas' complaints.

The decline of Arkansas River flows into Kansas appears to be admitted. At issue are the cause or causes, and whether Compact violations are involved. Kansas has made good faith allegations of such violations, and

has presented preliminary studies to support its position. Certainly the future effectiveness of the Compact Administration requires timely resolution of these allegations. However, the Administration structure is such that even a preliminary investigation of the allegations has not proceeded. By exercising its veto on the Commission, though done in good faith, Colorado has effectively prevented "authoritative Commission action." (cf. *Texas v. New Mexico, supra,* 462 U.S. 554, 568)

The Special Master believes that Kansas has met its obligations under the law, and that returning these issues to the Compact Administration would not prove effective, nor would further delay be fair. Accordingly, Colorado's Motion is hereby denied.

DATED: October 21, 1988

/s/ Arthur L. Littleworth
Arthur L. Littleworth
Special Master

PROOF OF SERVICE BY MAIL
(1013A, 2015.5 C. C. P.)

STATE OF CALIFORNIA, COUNTY OF RIVERSIDE

I am a citizen of the United States and a resident of the county aforesaid; I am over the age of eighteen years and not a party to the within entitled action; my business address is:

BEST, BEST & KRIEGER, 3750 University Avenue, 400 Mission Square, P.O. Box 1028, Riverside, CA 92502. *On* October 21, 1988, *I served the within* DECISION OF SPECIAL MASTER ON COLORADO MOTION TO STAY *on the* interested parties listed below *in said action, by placing a true copy thereof enclosed in a sealed envelope with postage thereon fully prepaid, in the United States mail at* Riverside, California *addressed as follows:*

Richard A. Simms, Esq.
Attorney at Law
P.O. Box 280
Santa Fe, NM 87504

David W. Robbins, Esq.
Hill & Robbins
100 Blake Street Building
1441 Eighteenth Street
Denver, CO 80202

Patricia Weiss, Esq.
U. S. Department of Justice
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Washington, D.C. 20044

Andrew F. Walch, Esq.
U. S. Department of Justice
Land & Natural Resources Division
3305 Federal Building
650 Capitol Mall
Sacramento, CA 95814

I declare, under penalty of perjury, that the foregoing is true and correct.

Executed on October 21, 1988 *at* Riverside, *California*
(date) *(Place)*

/s/ Sandra L. Simmons
Signature
Sandra L. Simmons

APPENDIX – Exhibit 6

Order re Kansas Motion to Bifurcate Proceedings, filed January 2, 1990

IN THE SUPREME COURT OF THE UNITED STATES

STATE OF KANSAS, Plaintiff, v. STATE OF COLORADO, Defendant.	)	No. 105, Original October Term, 1985

ORDER RE KANSAS MOTION TO BIFURCATE PROCEEDINGS

(Filed Jan, 2, 1990)

On May 19, 1989, Kansas filed a Second Motion to Amend Complaint and to Bifurcate Proceedings. The proposed amendment to the Complaint has been ruled upon, but not the bifurcation motion. Kansas urged in its motion that "[A]ll proceedings relating to damages or compensation" be severed and reserved for subsequent proceedings after a final decision on liability. Colorado initially opposed the motion, arguing that the issues of liability and damages were so intertwined in this case that they could not be separated and still satisfy the criteria of Rule 42(b). Colorado was especially concerned that the bifurcation sought by Kansas might prejudice its ability to present evidence in support of its counterclaim and affirmative defenses of laches, estoppel, waiver and unclean hands.

At the hearing on November 6, 1989, the Special Master assured Colorado that no bifurcation of issues would impair Colorado's ability to present its affirmative defenses or counterclaim as part of the liability phase of

the trial. Subject to that condition, however, the Special Master outlined certain advantages of severing the entire remedy phase of the trial, including any monetary damages and expert testimony thereon, until the liability issue has been decided and the amounts of shortage, if any, have been determined.

After further discussion, counsel for Kansas stated his general support for such a bifurcation of the remedy phase of the trial. Colorado did not disagree, but continued to stress its primary concern that any bifurcation order not preclude Colorado from presenting "economic testimony" during the liability phase of the trial. Record of November 6, 1989, at 88. Counsel for Colorado explained that he wanted the ability, as part of any consideration of liability, to address the relationship between water use practices in both states and the economics of those practices, in order to assist in explaining why certain things were done and why certain changes occurred. The United States was not present at the November 6 hearing, but previously had stated that it took no position on the Kansas motion to bifurcate.

The underlying issue in this case is whether the State of Colorado and its water users, in violation of the Compact, have caused a material depletion in the usable quantities or availability of the waters of the Arkansas River for use by the water users in Kansas. If Kansas fails to show such a violation of the Compact, then of course it has no grounds for relief. Assuming, however, that liability is established, the remedy phase of the trial then promises to be complex and possibly quite lengthy. Kansas seeks both injunctive relief and damages. It has also indicated that it may propose the replacement of native

Arkansas River water with currently unused transmountain water. Moreover, the recent settlement in *Texas v. New Mexico* has left unresolved major issues over the way in which any monetary damages may be computed. The Special Master believes that these various remedy issues can best be addressed after liability has been determined, and any water shortages to Kansas have first been quantified.

Accordingly, and pursuant to Rule 42(b), the trial of this case will be bifurcated into a liability and a remedy phase, provided that the State of Colorado shall not be limited during the liability phase from introducing such economic or other evidence or testimony related to any damage that may be necessary to its defense on the issue of liability, or in support of its affirmative defenses or counterclaims. *See Texas v. New Mexico*, 446 U.S. 540 (1980); 462 U.S. 554 (1983); and 482 U.S. 124 (1987); *Smith v. Alyeska Pipeline Serv. Co.*, 538 F.Supp. 977 (D. Del. 1982); *Gasoline Products Co. v. Champlin Refining Co.* 283 U.S. 494, 500 (1931).

DATED: January 2, 1990

/s/ Arthur L. Littleworth
Arthur L. Littleworth
Special Master

PROOF OF SERVICE BY MAIL

STATE OF CALIFORNIA, COUNTY OF RIVERSIDE

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years and not a party to the within entitled action; my business address is Best, Best & Krieger, 400 Mission Square, 3750 University Avenue, Riverside, California 92502.

I am readily familiar with Best, Best & Krieger's practice for collecting and processing correspondence for mailing with the United States Postal Service. Under that practice, all correspondence is deposited with the United States Postal Service the same day it is collected and processed in the ordinary course of business.

On January 2, 1990, I served the within ORDER RE KANSAS MOTION TO BIFURCATE PROCEEDINGS, by placing a copy of the document in a separate envelope for each addressee named below and addressed to each such addressee as follows:

Richard A. Simms, Esq.
Simms & Stein
First Northern Plaza, Suite A
121 Sandoval Street
Santa Fe, New Mexico 87501

David W. Robbins, Esq.
Hill & Robbins
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1441 Eighteenth Street
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Patricia Weiss, Esq.
U.S. Department of Justice
Land & Natural Resources Division
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Andrew F. Walch, Esq.
U.S. Department of Justice
Land & Natural Resources Division
U.S. Federal Building
1961 Stout Street, #690
P.O. Drawer 3607
Denver, Colorado 80202

On January 2, 1990, at the office of Best, Best & Krieger, 3750 University Avenue, 400 Mission Square, Riverside, California 92502, I sealed and placed each envelope for collection and deposit by Best, Best & Krieger in the United States Postal Service, following ordinary business practices.

I declare under penalty of perjury under the laws of the State of California, that the foregoing is true and correct.

Executed on January 2, 1990, at Riverside, California.

/s/ Sandra L. Simmons
Sandra L. Simmons

APPENDIX – Exhibit 7

Order re Pre-Trial Discovery and Procedures, filed March 7, 1990; Order Amending Order re Pre-Trial Discovery and Procedures, filed May 25, 1990

IN THE SUPREME COURT OF THE UNITED STATES

STATE OF KANSAS,	)	
Plaintiff,	)	No. 105, Original
	)	October Term,
v.	)	1985
STATE OF COLORADO,	)	
	)	
Defendant.	)	
	)	

ORDER RE PRE-TRIAL DISCOVERY AND PROCEDURES
(Filed Mar. 7, 1990)

This Order is intended to govern the discovery procedures for expert witnesses and certain other pre-trial issues. Additional pre-trial orders may still be required. This Order arises from a Pre-trial Conference held on February 16, 1990 before the Honorable Arthur L. Littleworth, Special Master. Appearing at the conference on behalf of Petitioner, State of Kansas, were Richard A. Simms, Esq. and John B. Draper, Esq. Appearing on behalf of Respondent, State of Colorado, were David W. Robbins, Esq. and Dennis M. Montgomery, Esq. Appearing on behalf of Intervenor, United States of America, was David Shuey, Esq. This Order has been prepared after extensive discussion with counsel and after consideration by the Special Master of proposed draft pre-trial orders prepared, respectively, by counsel for the State of Colorado and counsel for the State of Kansas. Based upon that discussion and review,

IT IS HEREBY ORDERED as follows:

I.

STATEMENTS OF ENTITLEMENT UNDER THE PROVISIONS OF THE COMPACT

For the purpose of furthering the Special Master's understanding of the issues and positions of the parties in this case, and in response to certain discovery issues, Kansas and Colorado by April 2, 1990 shall each file and serve on the other parties a statement setting forth their respective views on the entitlements of each State under the Arkansas River Compact to receive or use the waters of the Arkansas River. These statements shall be complete and shall take into account all provisions of the Compact. The United States may, but is not required to, also submit its views on the subject.

II.

DESIGNATION OF ADDITIONAL EXPERT WITNESSES BY THE STATE OF KANSAS

By motion filed February 15, 1990, the State of Kansas sought leave of the Special Master to designate five additional expert witnesses. That motion is hereby granted. Colorado indicated at the Pre-trial Conference that it did not intend to designate any additional experts. It is understood that the expert identifications required and made on January 15, 1990, together with the additional designations authorized hereby, do not include any experts required in any damage phase of the trial. Nor does this Order cover any rebuttal witnesses or exhibits.

III.

STATEMENT OF THE FACTS AND OPINIONS OF KANSAS' EXPERTS

Not later than Monday, April 2, 1990, the State of Kansas shall provide a statement of the substance of the facts and opinions to which its experts are expected to testify and a summary of the grounds for each opinion stated, as required by Rule 26(b)(4)(A)(i).

IV.

SCHEDULE FOR DEPOSITIONS FOR KANSAS' EXPERTS BY COLORADO AND THE UNITED STATES

The State of Colorado and the United States of America will be permitted to begin discovery of Kansas' experts by deposition and by subpoena *duces tecum* on Friday, April 6, 1990. Colorado and the United States shall have a right to depose Kansas' experts for a period of two months concluding Wednesday, June 6, 1990. Depositions of the experts for Colorado and United States will follow as provided in Section VI hereof. The following rules, *inter alia*, shall apply to these depositions:

A. The parties have indicated that they will cooperate in the scheduling of individual depositions of expert witnesses, and no additional orders in that regard are now required.

B. No subpoenas will be necessary to ensure that identified witnesses appear at and bring documents to depositions, except for witnesses who will not appear voluntarily and over whom the parties have no control.

Listing the documents requested on the notice of deposition will be sufficient.

C. If it develops in the course of any deposition that an expert has relied upon material not in possession of the deposing party, such material shall be provided promptly to all parties.

D. During the two-month period of time, other discovery by any party (except for depositions of Colorado's and United States' experts) shall not be precluded, provided and to the extent such discovery does not interfere with the deposition of Kansas' experts by Colorado and the United States.

E. The scope of authorized discovery, both as to depositions and the production of documents, of the expert witnesses designated by the State of Kansas shall encompass the following:

1. All instructions to the expert, not otherwise privileged, relating to the scope of his or her assignment, including all documents relating thereto;

2. All data, documents, interview notes or other material relied upon or reviewed by the expert in preparing for testimony; provided that material reviewed but not relied upon need not be produced except upon special showing.

3. All notes, records, draft reports, preliminary reports, or other preliminary materials prepared by a designated expert witness; provided that the production of draft or preliminary material shall not be required unless the expert

has changed any opinion expressed therein, or upon other special showing.

4. All final reports, exhibits, charts, graphs, tables or other materials prepared by the expert.

F. Based upon the representations of counsel, the Special Master understands that for budgetary reasons experts for the State of Kansas have not prepared final reports which set forth their opinions and the grounds therefor. The Special Master expects, however, that the State of Kansas will endeavor to organize whatever written documents have been prepared by its experts in a way that will expedite discovery by Colorado and the United States. Should the absence of final reports for Kansas' experts unduly delay discovery by Colorado and the United States, the Special Master will reconsider the time required for expert discovery.

G. Expert depositions by Colorado and the United States shall proceed, insofar as practical, without interruption. If such depositions can be completed in less than the allotted two months, this shall be done. In such event the two months allowed for expert depositions by Kansas shall be advanced from the June 8 commencement date set in Section VI hereof. Likewise, the statements required of Colorado and the United States in Section V shall be provided at least four days before Kansas begins.

H. The resolution of any discovery disputes arising during depositions shall be undertaken at the time of the

deposition, by telephone to the Special Master, or as soon thereafter as is possible.

V.

STATEMENT OF FACTS AND OPINIONS OF COLORADO AND UNITED STATES EXPERTS

Not later than Monday, June 4, 1990, the State of Colorado and the United States shall each provide a statement of the substance of the facts and opinions to which their expert witnesses are expected to testify and the summary of the grounds for each opinion stated, as required by Rule 26(b)(4)(A)(i).

VI.

SCHEDULE FOR DEPOSITIONS FOR COLORADO'S AND UNITED STATES' EXPERTS BY KANSAS

The State of Kansas will be permitted to begin discovery of Colorado's and United States' experts by deposition and by subpoena *duces tecum* on Friday, June 8, 1990. Kansas shall have a right to depose Colorado's and the United States' expert witnesses for a period of two months concluding Wednesday, August 8, 1990. Corresponding rules to those set forth in Sections IV A, B, C, D, E and H shall also apply to these depositions by Kansas.

VII.

AGREEMENTS REGARDING DEPOSITIONS OF EXPERTS, INCLUDING FEES AND EXPENSES

Discovery of experts by deposition shall be precluded except as provided herein or as agreed to by the

parties. Each party shall pay the expert fees and expenses to depose another party's expert witnesses; provided, however, that such fees and expenses shall be limited to the time actually spent in deposition and the reasonable expenses of travel, hotel and meals if the deposition is scheduled at a location other than where the expert witness resides or has his or her principal place of business. The parties agree that depositions of all experts may be taken in Denver, Colorado, and that the party electing to take the deposition of an expert who does not reside or have his or her principal place of business in Denver, Colorado, shall pay the travel expenses of such expert, including airfare and reasonable expenses for hotel and meals during the deposition, in order to take such depositions in Denver, Colorado. The attorneys agree to make the expert witnesses identified by the party they represent available for deposition in accordance with his schedule. In the event any expert is not available to be deposed in accordance with the schedule provided for in this Order for any reason, the parties shall attempt to agree on alternative dates for such deposition, and a modification of the schedule herein. If the parties cannot agree, the party desiring to take the deposition may apply to the Special Master to schedule the deposition and to make such modification as the Special Master deems fair and just under the circumstances.

VIII.

DISCLOSURE OF NON-EXPERT WITNESSES BY COLORADO

By Friday, June 15, 1990 the State of Colorado shall identify all of its non-expert witnesses who are expected

to testify at trial, including their addresses and telephone numbers, together with a summary of testimony of each such witness.

IX.

PRE-TRIAL STATEMENTS

On or before Wednesday, August 15, 1990, the parties shall file pre-trial statements setting forth any stipulations concerning joint exhibits, any admissions of fact, data or documents, a statement of disputed issues of fact and law, and a list of exhibits which may be offered at trial. In addition, the pre-trial statements of Kansas and the United States shall identify all of their non-expert witnesses who are expected to testify at trial, including their addresses and telephone numbers, together with a summary of the testimony of each such witness.

By Wednesday, August 29, 1990, the parties may petition the Special Master for leave to add the name of any additional non-expert witness who could not reasonably have been anticipated to be required as a witness until after the initial identification of non-expert witnesses by others, and for leave to add any additional exhibits which could not reasonably have been anticipated to be required until after the initial designation of exhibits by others. Thereafter, additional exhibits may not be endorsed or offered, except for impeachment or rebuttal exhibits, with the following limited exception: a party may petition the Special Master to admit additional exhibits or testimony whose existence was not known or could not have been foreseen or on the grounds that the ends of justice require, and the Special Master may admit

such exhibits or testimony at his discretion, but only on such conditions as the Special Master deems just under the circumstances and which can be permitted without undue prejudice to other parties.

X.

EXCHANGE OF COPIES OF EXHIBITS; OBJECTIONS TO AUTHENTICITY OF EXHIBITS

Except for any joint exhibits to which the parties may have agreed, the parties shall provide copies of all exhibits to other parties by Wednesday, August 15, 1990, unless photocopying is impractical because of the size or unusual length of the exhibit, in which case the exhibit shall be made available for inspection in Denver, Colorado. The authenticity of all documents designated as exhibits shall be deemed admitted unless a party files a written statement by August 29, 1990, identifying the specific documents, the authenticity of which are not admitted.

XI.

DATES FOR FILING PRE-TRIAL MOTIONS

All pre-trial motions shall be filed no later than August 15, 1990.

XII.

CUT-OFF DATE FOR ALL DISCOVERY

To enable the parties to prepare for trial, no discovery shall be conducted or required after August 8, 1990,

except for non-expert witness depositions which may be taken until August 31, 1990.

XIII.

TRIAL DATE

To permit full and fair discovery by all parties, and at the request of both States, the trial date now set for July 16, 1990 will be vacated and the trial date reset to commence Monday, September 17, 1990.

XIV.

This Order may be amended for good cause shown.

DATED: March 7, 1990.

/s/ Arthur L. Littleworth
Arthur L. Littleworth
Special Master

PROOF OF SERVICE BY MAIL

STATE OF CALIFORNIA, COUNTY OF RIVERSIDE

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years and not a party to the within entitled action; my business address is Best, Best & Krieger, 400 Mission Square, 3750 University Avenue, Riverside, California 92502.

I am readily familiar with Best, Best & Krieger's practice for collecting and processing correspondence for mailing with the United States Postal Service. Under that practice, all correspondence is deposited with the United States Postal Service the same day it is collected and processed in the ordinary course of business.

On March 7, 1990, I served the within ORDER RE PRE-TRIAL DISCOVERY AND PROCEDURES by placing a copy of the document in a separate envelope for each addressee named below and addressed to each such addressee as follows:

Richard A. Simms, Esq.
Simms & Stein
First Northern Plaza, Suite A
121 Sandoval Street
Santa Fe, New Mexico 87501

David W. Robbins, Esq.
Hill & Robbins
100 Blake Street Building
1441 Eighteenth Street
Denver, Colorado 80202

Patricia Weiss, Esq.
U.S. Department of Justice
Land & Natural Resources Division
General Litigation Section
P.O. Box 663
Benjamin Franklin Station
Washington, D.C. 20044-0663

Andrew F. Walch, Esq.
U.S. Department of Justice
Land & Natural Resources Division
U.S. Federal Building
1961 Stout Street, #690
P.O. Drawer 3607
Denver, Colorado 80202

On March 7, 1990, at the office of Best, Best & Krieger, 3750 University Avenue, 400 Mission Square, Riverside, California 92502, I sealed and placed each envelope for collection and deposit by Best, Best & Krieger in the United States Postal Service, following ordinary business practices.

I declare under penalty of perjury under the laws of the State of California, that the foregoing is true and correct.

Executed on March 7, 1990, at Riverside, California.

/s/ Sandra L. Simmons
Sandra L. Simmons

STATE OF KANSAS, Petitioner, v. STATE OF COLORADO, Respondent.	No. 105, Original United States Supreme Court October Term, 1985

ORDER AMENDING ORDER RE PRE-TRIAL DISCOVERY AND PROCEDURES

(Filed May 25, 1990)

By motion, the State of Colorado seeks: (1) an extension of one week in the period of time provided for its discovery of Kansas' expert witnesses by the Order re Pre-Trial Discovery and Procedures filed March 7, 1990; (2) a one week extension of the date for it and the United States to provide a statement of the substance of the facts and opinions to which their expert witnesses are expected to testify; and (3) a delay of one week of the date upon which Kansas may begin depositions of Colorado's and the United States' experts. The State of Kansas, by letter addressed to the Special Master, has indicated that it does not oppose the requested extension of Colorado's discovery period.

Good cause appearing therefore,

Colorado's motion to extend the period in which it may depose expert witnesses of the State of Kansas by one week is hereby granted. Paragraph IV of the Order re Pre-Trial Discovery and Procedures heretofore filed on March 7, 1990 is amended to provide that Colorado and

the United States shall have a right to depose Kansas' experts for a period concluding Wednesday, June 13, 1990. Further, Paragraph V of the Order re Pre-Trial Discovery and Procedures is amended to provide that the State of Colorado and the United States shall have until Monday, June 11, 1990 to provide a statement of the substance of the facts and opinions to which their expert witnesses are expected to testify and the summary of the grounds for each opinion stated. Finally, Paragraph VI of the Order re Pre-Trial Discovery and Procedures is amended to provide that discovery by the State of Kansas of Colorado's and the United States' experts by deposition and by subpoena duces tecum shall commence on Friday, June 15, 1990 and continue for a period of two months concluding Wednesday, August 15, 1990.

/s/ Arthur L. Littleworth
Arthur L. Littleworth
Special Master

PROOF OF SERVICE BY MAIL

STATE OF CALIFORNIA, COUNTY OF RIVERSIDE

I am a citizen of the United States and a resident of the County of Riverside; I am over the age of eighteen years and not a party to the within entitled action; my business address is Best, Best & Krieger, 400 Mission Square, 3750 University Avenue, Riverside, California 92501.

I am readily familiar with Best, Best & Krieger's practice for collecting and processing correspondence for mailing with the United States Postal Service. Under that practice, all correspondence is deposited with the United States Postal Service the same day it is collected and processed in the ordinary course of business.

On May 25, 1990, I served the within ORDER AMENDING ORDER RE PRE-TRIAL ORDER DISCOVERY AND PROCEDURES by placing a copy of the document in a separate envelope for each addressee named below and addressed to each such addressee as follows:

Richard A. Simms, Esq.
Simms & Stein
First Northern Plaza, Suite A
121 Sandoval Street
Santa Fe, New Mexico 87501

David W. Robbins, Esq.
Hill & Robbins
100 Blake Street Building
1441 Eighteenth Street
Denver, Colorado 80202

Patricia Weiss, Esq.
U.S. Department of Justice
Land & Natural Resources Division
General Litigation Section
P. O. Box 663
Benjamin Franklin Station
Washington, D.C. 20044-0663

Andrew F. Walch, Esq.
U.S. Department of Justice
Land & Natural Resources Division
U.S. Federal Building
1961 Stout Street, #690
P. O. Drawer 3607
Denver, Colorado 80202

On May 25, 1990, at the office of Best, Best & Krieger, 3750 University Avenue, 400 Mission Square, Riverside, California 92501, I sealed and placed each envelope for collection and deposit by Best, Best & Krieger in the United States Postal Service, following ordinary business practices.

I declare under penalty of perjury under the laws of the State of California, that the foregoing is true and correct and that this Proof of Service is executed on this 25th day of May, 1990 at Riverside, California.

/s/ Linda Hutton
Linda Hutton

APPENDIX – Exhibit 8

Order re Kansas Motion for Continuance,
filed March 27, 1991

IN THE SUPREME COURT OF THE UNITED STATES

STATE OF KANSAS, Plaintiff, v. STATE OF COLORADO, Defendant.	)	No. 105, Original October Term, 1985

ORDER RE KANSAS MOTION FOR CONTINUANCE

(Filed Mar. 27, 1991)

The trial in this case began on September 17, 1990. While counsel for all parties originally estimated that the first phase[1] of the trial would require between two and three months, Kansas still had not completed its case when the trial was temporarily recessed on February 20, 1991, after some 57 trial days.

The first Kansas witness was Dr. Douglas R. Littlefield, an historian, who testified extensively on the events leading up to the 1949 Arkansas River Compact, and on the negotiation of the Compact itself. His testimony and cross-examination extended over 11 trial days, from September 18 to October 16, 1990. He provided support for the Kansas position concerning the intent of the Compact, Kansas' entitlement thereunder, and the Colorado obligations.

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[1] The trial was bifurcated by Order dated January 2, 1990. The first phase relates to liability only. If liability is established, then the trial will resume for the remedy phase, including damages.

Kansas then followed with a number of witnesses, primarily experts, who presented evidence on what has occurred since the Compact was approved in 1949. Much of this evidence consisted of basic hydrologic and land use data that was also used in the development of the Kansas "hydrologic-institutional" computer model. Although Colorado has yet to begin its case, it is clear from the pretrial statements and from cross-examination that much of this voluminous basic information is in dispute.

For example, post-Compact groundwater pumping in Colorado, and its impact on the flows of the Arkansas River reaching Kansas, certainly constitute major issues in this case. Yet there are no official records that fully detail the large number of wells that have been drilled since 1949, nor the amounts of water that have been pumped over the years. Groundwater production must be estimated through the use of utility records for those wells equipped with electric motors, but a sizable number of wells are fueled with natural gas, for which no comparable utility records are available. Records are also lacking on the number of acres irrigated and the kinds of crops grown. The crop mixture, of course, affects the amount of water used. Agricultural usage must therefore be pieced together from various records, surveys, and aerial photographs. Streamflow records are also incomplete. While flows of the Arkansas River are gauged at numerous points, and those measurements do not seem to be in dispute, many of the tributaries are not gauged at all, and others have only incomplete records. The patterns of historic flows in the Arkansas River have also been altered by the operation of three large reservoirs in

Colorado. Moreover, in recent years, large amounts of water from the western slopes of the Rocky Mountains, to which Kansas claims no rights, have been imported to augment the Arkansas River Basin supplies in Colorado.

These are not the only areas of important factual dispute, but they serve to illustrate the complexity of determining the impact of changes that have occurred since 1949, and whether such changes constitute one or more violations of the Arkansas River Compact.

The chief technical expert for the State of Kansas has been Timothy J. Durbin. He began his work for Kansas in 1985, investigating various possible causes for the depletion of flows in the Arkansas River at the Colorado-Kansas state line. He took the stand on January 14, 1991. In the vernacular of the baseball season, he was Kansas' cleanup hitter. He took much of the evidence introduced by earlier Kansas expert witnesses, blended it into his own investigation, and reached specific conclusions about the causes of depletion in stateline flows. His conclusions were derived from three separate approaches: a statistical analysis, a water budget analysis, and the results of a complex hydrologic-institutional model of the Arkansas River Basin. Only through the model, however, did he allocate specific amounts of depletion to specific causes. For example, he prepared a summary matrix (Kansas Exhibits 111* and 112*) that showed what the stateline flows would have been in the absence of post-compact well pumping in Colorado, and separately, the amount of reduction in stateline flows caused by the winter water storage program in Colorado. Kansas maintains that both of these constitute Compact violations. Mr.

Durbin completed his testimony on January 24, 1991, and cross-examination by Colorado began on the same day.

During cross-examination, a number of mistakes were uncovered in certain Kansas exhibits. Some were merely plotting errors, e.g., discrepancies between actual tabulated data and the graphs or summaries portraying those data on display exhibits. Some errors, however, were more substantive, and some affected the program coding instructions used in the model. Kansas began to respond by overnight preparation of revised exhibits.[2] Mr. Durbin had the responsibility of explaining the revisions, but in some instances a second or third revision was offered even before there had been any opportunity to testify on the first. Errors in coding or handling data in the model presented even more difficulties. Mr. Durbin stated that more time would be required for these analyses and changes.[3] It was finally agreed that Mr. Durbin would be withdrawn from the stand and given time to correct the errors in the model and other Kansas exhibits, as might be appropriate, and then would return for additional examination at a time to be worked out. (Rep. Tr., LIV, Feb. 14, p. 101)

Kansas then called as its next witness Dr. Lawrence J. Lefkoff, who had assisted Mr. Durbin and had direct

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[2] For example, on January 28 Kansas offered 13 revised exhibits, and the next day produced another 10.

[3] Colorado indicated that the error with respect to the winter water storage program had a major impact. It claimed that when monthly flows were properly adjusted, the result would show that the winter water storage program had no adverse effect on stateline flows, thus eliminating one of Kansas' claims.

responsibility for certain aspects of the model. His direct testimony, apart from that related to revisions of the model, was completed on February 15.

The trial resumed on February 19. At the outset, Mr. Simms, counsel for Kansas, reported in chambers that Mr. Durbin had been admitted over the weekend to a psychiatric hospital with severe depression. At that time, Mr. Simms had not been able to contact Mr. Durbin's physician directly, and he had little additional information. The trial proceeded with the cross-examination of Dr. Lefkoff, while Mr. Simms attempted to learn more.

On the next day, February 20, an extensive conference was held in chambers, and summary statements were then made to the court reporter. That transcript was ordered sealed, except as it was necessary for counsel to advise their parties of what had occurred and the reasons for delay. Essentially, however, counsel for Kansas indicated that Mr. Durbin would not be able to work on the case for at least three months, and perhaps would not be able to return at all. Colorado requested that the services of an independent Board-certified psychiatrist be secured to review Mr. Durbin's situation and then report to the Master. Colorado stated that it would pay for the cost of such an examination and report. Colorado also argued that any extended postponement in the trial was unnecessary and would be highly prejudicial to Colorado, no matter what Mr. Durbin's future condition might be. At the conclusion of that session, Kansas was ordered to file a written motion for continuance by March 1, Colorado's request for an independent medical opinion was approved, and at the close of the day the trial was

recessed until further order. At that time, Dr. Lefkoff's cross-examination was not completed.

Kansas' written motion seeks a continuance of seven months. It is based upon a brief affidavit from Jean A. Warren, M.D., Mr. Durbin's attending psychiatrist, stating that he is suffering from a major depression; that three months will be required for treatment and convalescence; and that he would then most likely be able to return to his customary work, but there is no guarantee of that fact. The Kansas motion states that it intends to expand the roles of several expert witnesses already involved in the case in order to fill the void created by Mr. Durbin's illness. The principal replacement appears to be Steven P. Larson. His affidavit states that three months would be required "to come up to Mr. Durbin's level of knowledge," and because of prior commitments in a number of other cases, a minimum of seven months would be required for him to be able to testify here.

Colorado filed a response, objecting to such a lengthy continuance, and indicating that if this were ordered the case would actually have to go over for at least a year. Colorado's chief counsel is scheduled to try another major water case in October, 1991, and a number of the expert witnesses here are also involved in that case. Colorado had reported this commitment early on, but under the original scheduling of this case, there did not appear to be any conflict.

Colorado is skeptical about the need for any lengthy delay. It argues that the Kansas case is almost complete, and that the expected revisions in programming the model can be done by Dr. Lefkoff. Indeed, Mr. Durbin

testified that most of the problems were being analyzed by Dr. Lefkoff and necessary coding changes were being made by him.[4] However, there were parts of Mr. Durbin's testimony that were also under revision (including the statistical and water budget analyses), and Dr. Lefkoff had not participated in that work.

In its motion, Kansas also argued that Mr. Durbin would be needed to assist Kansas counsel in the cross-examination of Colorado experts on phreatophytes and pumping estimates, as well as on modeling. (Motion, p. 3) Colorado properly points out, however, that Dr. Groeneveld and Mr. Book, respectively, were the Kansas experts on phreatophytes and groundwater pumping. (Colorado Response, p. 15) Mr. Durbin was not listed as a witness on either of these subjects, nor on basic data. In fact, most of the basic data used in the Kansas hydrologic-institutional model came to Mr. Durbin from other Kansas experts.

With the consent of Dr. Warren, I did arrange for a second opinion from a Board-certified psychiatrist, Dr. Robert M. Bittle. He examined Mr. Durbin on March 2,

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[4] Mr. Durbin testified that Dr. Lefkoff was doing the work associated with program changes on the winter water storage program, and in the distribution of recharge in irrigated areas. (Rep. Tr., LIII, February 13, pp.8-10) Moreover, Mr. Durbin identified a number of other problem areas that were being reviewed by Dr. Lefkoff and that would probably require corrections by him: use of native flows in District 67, transit losses, "want factors" for the Buffalo Canal, Kansas calls for water, storage of Amity water in John Martin Reservoir, off-channel storage when two storage rights are involved, and negative streamflows. (Rep. Tr., LIII, February 13, pp. 9, 10, 78, 80, 82-85)

1991, in his office for approximately three hours. This was the day that Mr. Durbin was released from Heritage Oaks, a psychiatric hospital in Sacramento. He had been admitted on February 16. Dr. Bittle also completed certain psychological testing, reviewed the hospital records, and interviewed Mrs. Durbin.

On March 8, I received an 18-page single-spaced report from Dr. Bittle. It was extremely comprehensive and included much information that I felt should be kept confidential. I did not forward a copy of this report to counsel, but I did promptly mail them a copy of his recommendations. Dr. Bittle's diagnosis was: "Major depressive illness, recurrent, without psychotic features, in partial remission." He felt that in approximately four weeks Mr. Durbin would be able to resume his trial duties. He informed me that Mr. Durbin was in agreement, and wanted to return.

On March 12 I arranged a conference telephone call with all counsel. While not discussing Dr. Bittle's report in detail, I indicated that there was no doubt that Mr. Durbin's condition leading to his hospitalization was indeed serious. Nonetheless, in view of Dr. Bittle's recommendation, I suggested that we return to court on April 8, that we finish what little remained on the Kansas case (except for the various exhibit and model revisions still under way), and that Colorado then begin its case, starting with subjects that would not require Mr. Durbin's participation. Colorado and the United States were in general agreement with this suggestion, but Kansas asked that I hold my decision until its reply brief had been received.

The Kansas reply brief included an additional affidavit from Dr. Warren, and two separate affidavits from church counselors who indicated that they had been counseling Mr. Durbin and his family since 1986. Each of these affiants disagreed with Dr. Bittle. Moreover, the two counselors indicated that they had spoken recently with Mr. Durbin and that he did not believe he would be ready to return to the trial within a month. I called Dr. Bittle and relayed these additional opinions to him. He said that he wanted to talk again with Mr. Durbin and that he would get back to me as soon as possible.

Dr. Bittle called on March 19. In substance, he reported that Mr. Durbin appeared to be a different person from the man he had seen just after his release from the hospital, that Mr. Durbin no longer believes that he can participate, and, without discussing the reasons here, that Dr. Bittle agrees. A confirming letter has also been received from Dr. Bittle. From my conversations with Dr. Bittle, and my review of all of the medical reports, I have concluded that Mr. Durbin should not be pressured into returning, and that we must assume that he will not be able to resume his trial responsibilities soon, if at all.

Colorado argues, nonetheless, that Dr. Lefkoff should be able to replace Mr. Durbin since they "were jointly listed as expected to testify to the same facts and opinions." (Response, p. 11) It was clear, however, from the depositions and from the Kansas direct testimony that Dr. Lefkoff's responsibilities were much more limited than those of Mr. Durbin. His model responsibilities were confined to the development of the administrative and land modules of the overall model, and running the model to calculate stateline depletions. (Rep. Tr., LIV, Feb. 14, at p.

112) Most of the work done in relation to the precipitation-runoff modeling, and the groundwater modeling, was done prior to Dr. Lefkoff's employment. (Dr. Lefkoff deposition, May 15, 1990, at pp. 10-11) Nor did he have responsibilities for the statistical and water budget analyses presented by Mr. Durbin, and for which possible revisions are still pending. But perhaps of overriding importance is the fact that Mr. Durbin was Kansas' "principal expert in the critical area of hydrology," and Kansas should be entitled to select a replacement expert, if that is necessary, of equal experience and stature. (Kansas Reply, p. 23) While Kansas indicates that Dr. Lefkoff's role will be expanded, as will that of Spronk Water Engineers, Kansas has asked Steven P. Larson of S. S. Papadapulos to be the primary replacement for Mr. Durbin. It is his schedule that drives the motion for a seven month continuance.

Both States acknowledge that the granting of a continuance during trial lies within the sound discretion of the trial court. (Kansas Brief, pp. 2-3; Colorado Response, p. 9; *Johnston v. Harris County Flood Control District*, 869 F.2d 1565, 1570 (CA 5 1989); *Harmon v. Grande Tire Co., Inc.*, 821 F.2d 252, 256 (CA 5 1987)) Moreover, Special Masters have broad discretion in procedural matters relating to the receipt of evidence and the order of witnesses. The Federal Rules of Civil Procedure are advisory only. (Sup.Ct.Rule 17.2; see *California v. Southern Pacific Co.*, 157 U.S. 229, 249 (1895); *Ohio v. Kentucky*, 410 U.S. 641, 644 (1973))

In view of Mr. Durbin's unique role in the development and presentation of the Kansas case, and the important sovereign interests that are involved in this case, the

completion of the Kansas case on direct, and any rebuttal evidence, will be continued until either Mr. Durbin is able to resume the stand, or his replacement or replacements are prepared and available.[5] I will determine later the specific time for resuming this part of the trial, but such scheduling will not interfere with Mr. Robbins' prior trial commitment in October of this year. Nor should the delay otherwise be longer than is actually necessary.

This continuance is not granted to allow Kansas, as Colorado fears, "to redo its case." (Colo. Response, p. 9) Rather, it is intended only to allow Kansas to complete its case, and in particular, to remedy the errors in the model and other exhibits that were identified during cross-examination. Colorado suggests that this task should not be large, but having to defend revisions on the stand may invoke even more intense cross-examination than occurred originally. Kansas is relying upon the testimony of Mr. Durbin, or his replacement, to quantify the shortage in stateline flows, and to allocate the shortage among specific causes. No witness who carries this burden can afford to testify with less than full preparation.

The Kansas motion would also suspend the beginning of the Colorado case in chief. Kansas argues that it must have adequate expert assistance in order to evaluate the expert testimony and exhibits presented by Colorado. It says that "full access to expert assistance in the . . . defense of its case" is a fundamental due process

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[5] Dr. Danielson is an exception. He is Colorado's principal water official and is being called by Kansas as an adverse witness. He will be fitted in during the Colorado case as his schedule permits.

right, citing *Ake v. Oklahoma*, 470 U.S. 68 (1985). (Kansas Brief, p. 5) Mr. Durbin is said to be the person who was intended to fill that role. Kansas contends that effective cross-examination of the opposing party's expert may require a continuance, citing *Anzaldo v. Croes*, 478 F.2d 446 (CA 8 1973); *Nutt v. Black Hills Stage Lines*, 452 F.2d 480 (CA 8 1971); *Smith v. Massachusetts Institute of Technology*, 877 F.2d 1106, 1110-1112 (CA 1 1989).

Certain issues, however, have nothing to do with Mr. Durbin's assignments, e.g., the Compact negotiations and its meaning, the operations of the Trinidad Reservoir, and the administration of water rights in both Kansas and Colorado. Even in the areas of hydrology and land use, Kansas presented much of its evidence through other experts. Dr. Groeneveld was its witness on the use of water by phreatophytes. Spronk Water Engineers provided the basic data on groundwater pumping, irrigated acreage, water use, and streamflow measurements. Testimony on geology and groundwater movement came from John W. Shomaker. Thus, the Kansas interests on many issues can be fully protected through the assistance of its other experts, and the presence of Mr. Durbin, or his replacement, while perhaps useful, does not seem to be essential in these areas.

Colorado is prepared and has been waiting to begin its case. It does not want it to be further postponed. The prejudice resulting from a lengthy delay is obvious. Voluminous amounts of detailed information have been analyzed, assembled and absorbed by the expert witnesses for this case, but that kind of preparation cannot be kept in mind over time. I too would like to see the

Colorado basic case while the Kansas evidence is still fresh.

There can be little doubt that Kansas did intend to rely on Mr. Durbin for help with Colorado's modeling efforts. Yet even in this area, Kansas is not wholly without resources. Depositions were taken. Computer programs and data were exchanged. And, of course, Dr. Lefkoff is still available. Any substantial prejudice to Kansas can be avoided by reserving its right of cross-examination with respect to Colorado's modeling evidence.

Accordingly, it is hereby ordered that the trial resume on April 9 at 9:30 a.m. in Courtroom Three of the Court of Appeals Courthouse in Pasadena with the completion of Dr. Lefkoff's cross-examination, apart from the results of any revisions to the Kansas modeling evidence. Colorado will then begin the presentation of its case. Kansas will have the right to reserve all or part of its cross-examination with respect to Colorado's modeling testimony, and to complete such cross-examination when appropriate expert assistance becomes available, or when Kansas completes its case. In addition, the order of Colorado witnesses shall be arranged, to the extent feasible, to permit Mr. Spronk to be present on subjects within his expertise. In view of Mr. Durbin's absence, Mr. Spronk's attendance assumes greater importance, but his affidavit identifies certain difficult scheduling conflicts. If these

conflicts cannot be avoided, then Kansas' cross-examination may also be reserved on these witnesses until Mr. Spronk can be present or Kansas completes its case.

DATED: March 27, 1991

/s/ Arthur L. Littleworth
Arthur L. Littleworth,
Special Master

PROOF OF SERVICE BY MAIL

STATE OF CALIFORNIA, COUNTY OF RIVERSIDE

I am citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years and not a party to the within entitled action; my business address is Best, Best & Krieger, 3750 University Avenue, 400 Mission Square, Riverside, California 92502.

I am readily familiar with Best, Best & Krieger's practice for collecting and processing correspondence for mailing with the United States Postal Service. Under that practice, all correspondence is deposited with the United States Postal Service the same day it is collected and processed in the ordinary course of business.

On March 27, 1991, I served the within **ORDER RE KANSAS MOTION FOR CONTINUANCE** by placing a copy of the document in a separate envelope for each addressee named below and addressed to each such addressee as follows:

Richard A. Simms, Esq.
Simms & Stein
First Northern Plaza, Suite A
121 Sandoval Street
Santa Fe, New Mexico 87501

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U.S. Department of Justice
Land & Natural Resources Division
General Litigation Section
P.O. Box 663
Benjamin Franklin Station
Washington, D.C. 20044-0663

Andrew F. Walch, Esq.
U.S. Department of Justice
Land & Natural Resources Division
U.S. Federal Building
1961 Stout Street, #690
P.O. Drawer 3607
Denver, Colorado 80202

On March 27, 1991, at the office of Best, Best & Krieger, 3750 University Avenue, 400 Mission Square, Riverside, California 92502, I sealed and placed each envelope for collection and deposit by Best, Best & Krieger in the United States Postal Service, following ordinary business practices.

I declare under penalty of perjury under the laws of the State of California, that the foregoing is true and correct.

Executed on March 27, 1991, at Riverside, California.

/s/ Sandra L. Simmons
Sandra L. Simmons

APPENDIX – Exhibit 9

Order re Admissibility of Dr. Dracup Notes
(Kan. Exh. 746), filed February 9, 1993

IN THE SUPREME COURT OF THE UNITED STATES

STATE OF KANSAS, Plaintiff, v. STATE OF COLORADO, Defendant, UNITED STATES OF AMERICA, Intervenor.	)	No. 105 Original October Term, 1985

ORDER RE ADMISSIBILITY OF DR. DRACUP NOTES (KANSAS EXH. 746)

(Filed Feb. 9, 1993)

On September 8, 1992, in accordance with applicable procedures, the United States filed a summary of the proposed testimony of Dr. John A. Dracup, a UCLA engineering professor, to be called as a surrebuttal witness. Dr. Dracup had not testified during the United States' case in chief. Nor had he been designated earlier as a possible expert witness for the United States. On September 21, 1992 Kansas moved to exclude the proposed testimony on several grounds. The Kansas motion was denied, but subject to Kansas' right to take Dr. Dracup's deposition before the surrebuttal phase of the trial commenced.

Pursuant to a deposition notice and subpoena *duces tecum*, Dr. Dracup produced for Kansas certain notes that he had taken during a meeting on July 23, 1992 with two other expert witnesses who had testified earlier for the

United States. These witnesses were Charles W. Binder and Donald J. Finlayson.

That was the first time Dr. Dracup had met with other United States experts. The meeting lasted all day. Its purpose was to give him a technical briefing, and to help him prepare for his up-coming surrebuttal testimony. He was "very anxious about coming up to speed of a three-year court case . . . ." RT Vol. 141 at 76 (Dec. 16, 1992). Dr. Dracup took 25 pages of notes, of which two are the subject of this Order. These two pages of notes were probably taken within the first half hour of the meeting.

After commencement of Dr. Dracup's deposition, but before its completion, the United States unexpectedly announced that it had decided not to call Dr. Dracup as a surrebuttal witness. Nonetheless, Kansas sought to pursue the issue of his notes, claiming that the two pages in question were admissible as an admission, or an inconsistent statement of a witness, or a statement against interest.

Both the United States and Colorado objected strenuously, arguing that the notes involved multiple levels of hearsay and that no proper foundation for their admission had been established. Moreover, they asserted that the material in question was "highly prejudicial" and should not be examined by me, even during argument as to admissibility, unless there were no alternative.[1]

---

[1] In its final brief (page 2) the United States said, "It is difficult to imagine more prejudicial evidence or evidence more lacking in probative value."

Accordingly, the two pages of notes, attached to Dr. Dracup's deposition as Exhibit 1, remained sealed until resumption of trial on December 16, 1992. Messrs. Binder and Finlayson, as well as Dr. Dracup, were examined that day with respect to the hearsay and foundation issues. An expurgated version of Dr. Dracup's deposition was also admitted into evidence, without objection, as Kansas Exhibit 749. The sealed notes were not examined until it became clear that such action was necessary in order to evaluate Kansas' claim that the statements constituted an admission against the United States or an inconsistent declaration of its expert witnesses.

To begin with, I ruled from the bench on December 16 that the notes came within certain hearsay exceptions under Federal Rule 803. Although the United States has asked in its latest brief (filed February 1, 1993, page 3) that I reconsider this ruling, in my judgment it is still correct, and the ruling is hereby confirmed. While Dr. Dracup testified that he had no present recollection of the conversations during this July 23 meeting, it was undisputed that the notes were taken by him at that time. Moreover, this was an important meeting and Dr. Dracup said that he took the notes in order to stay focused, to pay close attention. He stated that the notes were his interpretation of what was being said over perhaps several minutes of time. For "complete details" of that meeting, he testified that he would have to go back to his notes. RT Vol. 141 at 74 (Dec. 16, 1992). Dr. Dracup is a Professor of Engineering and Applied Science at UCLA. Certainly his notes of such an important meeting may be viewed as being reasonably reliable, even if cryptic or if they only synthesize a period of conversation.

The specific portion of the notes in controversy reads:

CO: "We know we are guilty, but it can't be proved with any certainty" [quotation marks in original]

WWSP: Very small, if any effects — lost in the noise.

Kansas offered the two pages of Dracup notes, including the foregoing statements, as its Exhibit 746. Kansas took the position initially that the damaging statement constituted an admission by both the United States and Colorado. Kansas' Letter Brief, Dec. 9, 1992, page 8. Under Federal Rule 801(d)(2), an admission by a party-opponent is not hearsay. The statement of an expert witness can constitute an admission. However, if made by such an expert, the statement must be within the scope of the agency or employment. *Collins v. Wayne Corp.*, 621 Fed.2d 777, 781-782 (CA 5 1980); *Rollins v. Board of Governors*, 761 F.Supp. 939, 941-943 (D. R.I. 1991).

Here, the "CO" in the statement refers to Colorado, and Kansas argued that the entire statement "seems to refer to a quotation of a statement by a Colorado expert, counsel or official." Letter Brief, Dec. 9, 1992, page 8. However, Kansas was unable to present any evidence as to who that person might be. Nor did any witness have an explanation for the quotation marks around part of the statement. Accordingly, I ruled on December 16 that a sufficient foundation had not been laid to utilize the notes as an admission against Colorado, or as a statement inconsistent with the testimony of any Colorado witness. RT Vol. 141 at 61, 67 (Dec. 16, 1992). Nothing in the briefs recently filed compels a change in that ruling.

The remaining unresolved issue, on which the recent briefs have concentrated, is whether Kansas Exhibit 746 constitutes an admission against the United States, or an inconsistent statement by its expert witnesses, or a statement against interest, under Federal Rules of Evidence 801(d)(2), 804(B)(3), or 613. I have concluded that the Dracup notes are not admissible on any of these grounds.

Messrs. Binder and Finlayson both strongly denied making these statements, or anything like them. Assuming, however, that the notes do reflect what was said, the remarks are too ambiguous to constitute an admission by the United States. Looking first to the "guilty" statement, the U.S. experts may simply have been repeating a remark made by a Colorado source. The unusual quotation marks, and the reference to "CO" in the margin would seem to lead to such an inference. Indeed, Kansas has made this very argument. Letter Brief, Dec. 9, 1992, page 8. Under those circumstances, there would be no U.S. admission.

Nor is it clear that the "guilty" remark even refers to the winter water storage program, which was the only issue on which the U.S. experts testified. The "WWSP" statement may well be a separate subject from the "CO" statement. There is no reason to require a coupling of these two statements. Indeed, the text can be read as notes of two independent and unrelated subjects. The United States argues that the notes are in fact inconsistent — that the phrase "Very small, if any effects" does not fit with being "guilty". Kansas says the first statement could refer to Colorado's winter water storage program, rather than its post-compact well pumping, and that presumably the "we" would then include the United States. But

that argument does not really overcome the inconsistency between the two statements.

In short, the "guilty" remark could be an admission of the United States only if it expressed the views of Binder or Finlayson and if it referred to the Winter Water Storage Program. The evidence is simply not strong enough to support these conclusions. Fed. Rules Evid. rule 403.

Insofar as the "WWSP" note is concerned, it appears to reflect a statement by Binder or Finlayson, without the possible inference that they were merely quoting someone else. During the trial, neither of them testified to a specific impact resulting from the Winter Water Storage Program. Their evidence, rather, was directed at the Kansas analysis and conclusions, and the statement that any effect from the program was "lost in the noise" is consistent with their opinions on the Kansas evidence. They repeatedly made the point that the impacts shown by the Kansas model were less than the potential error associated with such analyses. I do not believe that this portion of the Dracup notes reflects any inconsistency with their court testimony, or any admission by the United States. Moreover, the foregoing analysis leaves no room for the suggestion that such a statement would be against the interest of either of these witnesses.

Despite ending the trial with such intense controversy over Kansas Exhibit 746, it may be worth recalling the tremendous body of evidence that has been submitted in this case. Decisions will be made on the basis of all of that evidence.

The offer to admit Kansas Exhibit 746 is hereby denied.

DATE: February 9, 1993

/s/ Arthur L. Littleworth
Arthur L. Littleworth
Special Master

PROOF OF SERVICE BY MAIL

STATE OF CALIFORNIA, COUNTY OF RIVERSIDE

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years and not a party to the within entitled action; my business address is Best, Best & Krieger, 3750 University Avenue, 400 Mission Square, Riverside, California 92502.

I am readily familiar with Best, Best & Krieger's practice for collecting and processing correspondence for mailing with the United States Postal Service. Under that practice, all correspondence is deposited with the United States Postal Service the same day it is collected and processed in the ordinary course of business.

On February, 1993, I served the within **ORDER RE ADMISSIBILITY OF DR. DRACUP NOTES (KANSAS EXH. 746)** by placing a copy of the document in a separate envelope for each addressee named below and addressed to each such addressee as follows:

John B. Draper
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Santa Fe, New Mexico 87504-2307

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Andrew F. Walch, Esq.
James J. DuBois, Esq.
U.S. Department of Justice
General Litigation Section
999 18th Street, Suite 945
Denver, Colorado 80202

On February 9, 1993, at the office of Best, Best & Krieger, 3750 University Avenue, 400 Mission Square, Riverside, California 92502, I sealed and placed each envelope for collection and deposit by Best, Best & Krieger in the United States Postal Service, following ordinary business practices.

I declare under penalty of perjury under the laws of the State of California, that the foregoing is true and correct.

Executed on February 9, 1993, at Riverside, California.

/s/ Sandra L. Simmons
Sandra L. Simmons

APPENDIX – Exhibit 10

Arkansas River Compact Administration Resolution Concerning an Operating Plan for John Martin Reservoir, adopted April 24, 1980, as revised May 10, 1984 and December 11, 1984

RESOLUTION
CONCERNING
AN OPERATING PLAN FOR
JOHN MARTIN RESERVOIR

WHEREAS, the Arkansas River Compact Administration, hereinafter referred to as the Administration, recognizes that, because of changes in the regime of the Arkansas River, the present operation of the conservation features of John Martin Reservoir does not result in the most efficient utilization possible of the water under its control;

WHEREAS, the Administration finds that adoption of an operating plan that establishes storage accounts for Kansas, for the ditches of Colorado Water District 67, and for other Colorado ditches as provided herein may result in more efficient utilization of the water under its control; and

WHEREAS, the Administration finds that provisions of the operating plan contained herein are permitted by and in compliance with the Arkansas River Compact, hereinafter referred to as the Compact; and the Rules and Regulations; and the Bylaws adopted by the Administration;

NOW THEREFORE, BE IT RESOLVED that the Administration approves and adopts the following operating plan:

I. Definitions:

A. "Period of winter storage" consists of the period of time commencing on November 1 of each year

and continuing to the first exhaustion of conservation storage during the compact year.

B. "Summer storage season" shall be the period of time commencing at the first exhaustion of conservation storage and continuing to and including the next succeeding October 31.

C. "Inflows" include all the normal accretions into John Martin Reservoir, measured or otherwise, including river flow but not including deliveries into the permanent pool or deliveries of other water as subsequently defined herein.

D. "Conservation storage" is water stored in the conservation pool that, but for the adoption of this resolution, would have comprised of the benefits arising from the construction of John Martin Reservoir.

E. "Other water" for regulation by John Martin Reservoir is water delivered into the accounts established in Section III, herein, and delivered under the authority of pre-Compact Colorado water rights. Deliveries of other water are permitted to gain increased utilization and greater beneficial use.

F. "Compact year" is the water accounting year of the Administration; it commences on November 1 of each year and extends to and includes the next succeeding October 31.

G. Except as provided herein, all words and terms used in this resolution have the meaning prescribed in Compact Article III.

II. Operating Principles:

A. Period of Winter Storage –

All inflows into John Martin Reservoir during a period of winter storage shall accrue to conservation storage. Conservation storage shall be released into the accounts specified in Subsection II D beginning at the first request for release after March 31 of account water by a Colorado Water District 67 ditch or by Kansas or beginning at 8:00 a.m. on April 7, whichever occurs first.

B. Summer Storage Season –

(1) When a runoff event occurs during the summer storage season, such that inflows into John Martin Reservoir are expected to exceed then existing irrigation requirements of the ditches in Colorado Water District 67 by at least 1,000 acre-feet, then the gates on John Martin Reservoir shall be closed commencing conservation storage except for releases of account water pursuant to Subsection II E, herein.

(2) The ditches in Colorado Water District 67 will be removed from the Colorado priority system when the sum of the flows of the Arkansas River at the Las Animas gaging station and the Purgatoire River at the Las Animas gaging station, exclusive of separate deliveries of other water under Section III, herein, indicates that conservation storage will occur.

(3) All inflows entering said reservoir during a period of conservation storage in the summer storage season shall accrue to conservation storage. Conservation storage shall be

released into the accounts specified in Section II D beginning at the first request for release of account water by a Colorado Water District 67 ditch or by Kansas or beginning 48 hours after commencement of conservation storage, whichever occurs first.

C. Exhaustion of Conservation Storage –

(1) For the purposes of Compact Article V F, the conservation pool shall be deemed exhausted whenever conservation storage has been completely released into the accounts. When this occurs, Colorado shall administer the decreed rights of water users in Colorado Water District 67 as against each other and as against all rights now or hereafter decreed to water users diverting upstream from John Martin Dam on the basis of relative priorities in the same manner in which their respective priority rights were administered before John Martin Reservoir began to operate and as though John Martin Dam had not been constructed. However, during these times, inflows shall, to the extent practical, be measured and released from the reservoir without temporary storage or averaging flows, and conservation storage may not be accumulated nor may storage in the accounts be increased except by deliveries of other water under Section III, herein.

(2) Administration in Colorado under decreed priorities shall be initiated so that ditches upstream from John Martin Reservoir shall deliver to the priorities of Colorado Water District 67 ditches water at the Arkansas

River at the Las Animas gaging station coincident with the exhaustion of the conservation storage when taking the flow of all waters, including that of the Purgatoire River, into appropriate consideration.

D. Release into the Accounts –

(1) When conservation storage is being released into the accounts according to the provisions of Subsections II A or II B, herein, it shall be released at the total rate of 1,000 cfs. However, when conservation storage exceeds 20,000 acre-feet, it shall be released at the total rate of 1,250 cfs.

(2) Releases of conservation storage shall be into accounts and said releases shall be apportioned 60 percent for the accounts of the Colorado Water District 67 ditches and 40 percent for the Kansas account.

(3) The releases for the Colorado Water District 67 ditches shall be distributed into individual accounts according to the following percentages:

Fort Bent	9.90 percent
Keesee	2.30 percent
Amity	49.50 percent
Lamar	19.80 percent
Hyde	1.30 percent
Manvel	2.40 percent
X-Y & Graham	5.10 percent
Buffalo	8.50 percent
Sisson – Stubbs	1.20 percent

E. Releases Out of Accounts –

(1) Kansas and the various Colorado ditches may demand the release of water contained

in their respective accounts, including those established in Section III herein, at any time at whatever rates they desire.

(2) Releases of water from the accounts, including those established in Section III herein, may be made simultaneously with releases from conservation storage into the accounts. However, such simultaneous releases cannot create deficits in those accounts.

(3) All such releases of account water from John Martin Reservoir to Colorado water users are subject to transit losses between John Martin Dam and the point of diversion from the Arkansas River, as determined by the Colorado Division Engineer, and the transit losses shall be borne by such releases.

(4) Releases of Kansas account water shall be measured at the Stateline as provided in Compact Article V E (3) allowing appropriate arrival times. If transit losses occur, those losses shall be determined by the Colorado Division Engineer and a representative of the Kansas Division of Water Resources and shall be replenished from the Kansas transit loss account. In the event that such losses at the end of the delivery are greater than the total in the Kansas transit loss account, then the deficit shall be made up from the next available transfers of other water under Subsection III D.

(5) The water users and the responsible officials of both Colorado and Kansas shall do their utmost to achieve maximum beneficial use including calling for deliveries of Kansas

account water during reasonable and favorable river conditions. When transit losses are deemed by the Colorado Division Engineer to be excessive, he shall so advise the receiving entity. Conversely, when river conditions are favorable for a delivery to Kansas, he shall so advise the Kansas Water Commissioner.

F. Evaporation charges shall be made against water stored in the accounts, including those established in Section III, herein, and the Kansas transit loss account, using formulas and procedures approved by the Colorado Division Engineer and a representative of the Kansas Division of Water Resources and using, when available, pan evaporation data provided by the Corps of Engineers. The evaporation charges shall be prorated amongst conservation storage and the accounts according to the amounts in them.

G. In the event that runoff conditions occur in the Arkansas River basin upstream from John Martin Reservoir that cause water to spill physically over the project's spillway, then water stored in the permanent pool in excess of 10,000 a.f. shall spill before the accounts granted in Subsection III A, B, and C, which shall spill before the accounts granted in Section II, which shall spill before the Kansas Transit Loss Account, all of which shall spill before the conservation pool water. The amount of spill from the accounts shall be prorated amongst them according to the amounts in them at the beginning of spill. During times of spill, the permanent pool shall occupy flood control space as provided in the Administration's Resolution of August 14, 1976, and Public Law 89-298.

III. Other Water for Regulation by John Martin Reservoir:

A. The Amity may store such water as it could otherwise divert from the Arkansas River for storage in the Great Plains Reservoir system in its account granted in Section II, herein. This water will be in addition to water released into the Amity account under Section II, herein.

B. An account for the Fort Lyon Canal is hereby granted in John Martin Reservoir for agricultural purposes only. The Fort Lyon Canal may deliver water into said account under an approved Pueblo winter storage plan subject to the limitations that total quantity in the account at any time cannot exceed 20, 000 acre-feet and that the delivery cannot include water that otherwise would have accumulated in conservation storage. The Fort Lyon may use water in this account for exchange with existing priorities. However, this account shall not be used in any manner to increase the permanent recreation pool, either by exchange, transfer, change of use, or otherwise. In the event that water accumulated in this account has not been completely released by the end of the compact year, then that water shall become conservation storage controlled by Subsection II A, herein.

C. An account for the Las Animas Consolidated Canal Company is hereby granted in John Martin Reservoir for agricultural purposes only. The Las Animas Consolidated Canal Company may deliver water into said account under an approved Pueblo winter storage plan subject to the limitations that total quantity in the account at any time cannot exceed 5,000 acre-feet and

that the delivery cannot include water that otherwise would have accumulated in conservation storage. The Las Animas Consolidated may use water in this account for exchange with existing priorities. However, this account shall not be used in any manner to increase the permanent recreation pool, either by exchange, transfer, change of use, or otherwise. In the event that water accumulated in this account has not been completely released by the end of the compact year, then that water shall become conservation storage controlled by Subsection II A.

D. Thirty-five percent of all water deliveries to John Martin Reservoir, under Subsections III A, III B, and III C, herein, during any compact year shall be transferred into the accounts for Kansas transit losses, for Kansas, and for Colorado Water District 67 ditches at the time of delivery in the following manner: First, transfers from deliveries shall make up deficits, if any, in the Kansas transit loss account which result from Subsection II E (4), herein, and shall then also fill the said Kansas transit loss account to the amount of 1,700 acre-feet. Then, of all such water delivered in excess of this specified amount, 11 percent of those deliveries shall be transferred to the Kansas account and 24 percent of those deliveries shall be transferred to the account of the Colorado Water District 67 ditches. Transfers into the accounts for Colorado Water District 67 ditches shall be distributed according to the percentages in Subsection II D (3), herein; except the Amity shall not share in distributions of deliveries under Subsection III A, herein.

IV. A permanent recreation pool has been authorized by the August 14, 1976, Resolution of the Administration. For purposes of the Resolution, this permanent recreation pool shall be considered a separate account and deliveries made to it are not subject to the transfers provided in Subsection III D, herein. The permanent recreation pool will, however, stand its pro rata share of evaporation as provided in the Administration's Resolution of August 14, 1976.

V. In the event of injury either to entities in Colorado or to Kansas, there shall be restitution from the first account water thereafter available from the entity receiving improper benefits. The engineering committee shall quantify such injury, subject to the approval of the Administration

VI. Adoption of this resolution does not prejudice the ability of Kansas or of any Colorado ditch to object or to otherwise represent its interest in present or future cases or controversies before the Administration or in a court of competent jurisdiction.

VII. This agreement shall be, and continue to be, in full force and effect from and after the date of execution of this resolution until March 31, 1981, and year to year thereafter subject to the following provisions:

A. Not later than December 1 of each year, the Colorado Division Engineer shall make an accounting of the operation under this resolution for the previous compact year available to the Operations Committee of the Administration and to interested parties. Either Colorado or Kansas, through its compact delegation, may then terminate this resolution on the next succeeding March 31 by giving written notice to the Administration by February 1 of the same compact year.

B. In the event this resolution is so terminated, then entities storing water in accounts prior to such termination may utilize such water during the next irrigation season under the provisions of this resolution. Water not utilized by the following November 1 shall revert to conservation storage.

VIII. This resolution supersedes in its entirety the agreement of December 12, 1978, concerning Amity-Great Plains water and the Resolution concerning an Interim Operating Plan for John Martin Reservoir entered into on March 21, 1980. All water delivered into the accounts established under the authorities of these two resolutions shall be forwarded and credited, without deductions, to the accounts for the same entities that are established in this operating plan.

Entered this 24th day of April, 1980, by special telephonic meeting, and revisions approved on May 10, 1984 and December 11, 1984.

/s/ Frank G. Cooley
Chairman
Arkansas River
Compact
Administration

/s/ James G. Rogers
Secretary
Arkansas River
Compact
Administration

/s/ J. William McDonald
Colorado Member
Arkansas River
Compact
Administration

/s/ David L. Pope
Kansas Member
Arkansas River
Compact
Administration

APPENDIX – Exhibit 11

Kansas Exhibit 111*** "Effects of Post-Compact Pumping and the Winter Water Program on Stateline Flows"

PLAINT

EFFECTS OF POST-COMPACT PU
ON S

	Institutional Conditions				D St
	Pumping	Winter Water	1980	Trans Mtn	(thou
Combined Effects	H C	H C	C C	H O	
Historical Pumping	H C	H H	H H	H H	
Winter Water	H H	H C	C C	H H	
Future Pumping	P C	C C	C C	O O	

H = Historical Conditions
C = Compact Conditions
O = No transmountain deliveries
P = Projected (future) pumping

IFF'S EXHIBIT 111***

Case No. 105

MPING AND THE WINTER WATER PROGRAM
TATELINE FLOWS

Revised 2/23/92

epletions of teline Flows 950 - 1985 and acre – feet)	Depletions Less Accretions of Stateline Flows 1950 - 1985 (thousand acre – feet)	Depletions of Usable Stateline Flows 1950 - 1985 (thousand acre – feet)
650	608	489
852	825	620
53	17	40
1150	1146	783

APPENDIX – Exhibit 12

Order to Correct Record re Defendant's Exhibits,
filed January 5, 1994

IN THE SUPREME COURT OF THE UNITED STATES

STATE OF KANSAS, Plaintiff, v. STATE OF COLORADO, Defendant, and UNITED STATES OF AMERICA, Defendant-Intervenor.	)	No. 105 Original October Term, 1985

ORDER TO CORRECT RECORD RE DEFENDANT'S EXHIBITS

(Filed Jan. 5, 1994)

The State of Colorado, the State of Kansas, and the United States have filed a Stipulation to Correct Record Re Defendant's Exhibits. Based on the Stipulation, which is hereby approved, the record of proceedings held before Special Master Arthur L. Littleworth is corrected as follows:

1. The record of proceedings for Monday, April 29, 1991, Volume LXXI (71) at page 4, line 19, is hereby corrected to refer to Defendant's Exhibit 88a, b, and c, not Defendant's Exhibit 168a, b, and c.

2. The record of proceedings for Monday, April 29, 1991, Volume LXXI (71) at page 23, lines 21-22, is hereby corrected to state that Defendant's Exhibit 88a, b, and c, not Defendant's Exhibit 168a, b, and c, was admitted. The

summary of the final status of the Colorado exhibits shall reflect that Defendant's Exhibit 88a, b, and c was admitted on April 29, 1991, and shall not include Defendant's Exhibit 168.

3. The record of proceedings for Wednesday, April 17, 1991, Volume LXIV (64) at page 66, line 23, is hereby corrected to refer to Defendant's Exhibit 679*, not Defendant's Exhibit 689*. The summary of the final status of the Colorado exhibits shall not include Defendant's Exhibit 689*.

DATE: Jan. 5, 1994.

/s/ Arthur L. Littleworth
Arthur L. Littleworth
Special Master

PROOF OF SERVICE BY MAIL

STATE OF CALIFORNIA, COUNTY OF RIVERSIDE

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years and not a party to the within entitled action; my business address is Best, Best & Krieger, 3750 University Avenue, 400 Mission Square, Riverside, California 92502.

I am readily familiar with Best, Best & Krieger's practice for collecting and processing correspondence for mailing with the United States Postal Service. Under that practice, all correspondence is deposited with the United States Postal Service the same day it is collected and processed in the ordinary course of business.

On January 5, 1994, I served the within **ORDER TO CORRECT RECORD RE DEFENDANT'S EXHIBITS** by placing a copy of the document in a separate envelope for each addressee named below and addressed to each such addressee as follows:

John B. Draper
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Hill & Robbins
100 Blake Street Building
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Andrew F. Walch, Esq.
James J. DuBois, Esq.
U.S. Department of Justice
General Litigation Section
999 18th Street, Suite 945
Denver, Colorado 80202

On January 5, 1994, at the office of Best, Best & Krieger, 3750 University Avenue, 400 Mission Square, Riverside, California 92502, I sealed and placed each envelope for collection and deposit by Best, Best & Krieger in the United States Postal Service, following ordinary business practices.

I declare under penalty of perjury under the laws of the State of California, that the foregoing is true and correct.

Executed on January 5, 1994, at Riverside, California.

/s/ Sandra L. Simmons
Sandra L. Simmons

APPENDIX - Exhibit 13

Order Regarding Plaintiff's
Exhibits, filed March 11, 1994

IN THE SUPREME COURT OF THE UNITED STATES

STATE OF KANSAS, Plaintiff, vs. STATE OF COLORADO, Defendant, and UNITED STATES OF AMERICA, Defendant-Intervenor.	)	No. 105, Original October Term 1985

ORDER REGARDING PLAINTIFF'S EXHIBITS

(Filed Mar. 11, 1994)

The State of Kansas, the State of Colorado, and the United States, by their respective counsel, have filed a Stipulation Regarding Plaintiff's Exhibits. Based on the Stipulation, which is hereby approved, the following is hereby ordered:

1. In the record of proceedings held before Special Master Arthur L. Littleworth, Volume 41 (January 16, 1991), at page 6, line 10, is in error in listing Plaintiff's Exhibit 61* and should have listed Plaintiff's Exhibit 61. The exhibits listed on page 6 were subsequently admitted on page 17, at lines 7-10. Accordingly, Volume 41 of the record of proceedings is hereby corrected as stated above, with the effect that the record of proceedings shall reflect that Plaintiff's Exhibit 61 is admitted. The summaries of the final status of the Kansas Exhibits shall reflect that

Plaintiff's Exhibit 61 was admitted and that Plaintiff's Exhibit 61* was not admitted.

2. In the record of proceedings held before the Special Master, Volume 31 (November 27, 1990), at pages 43, 56, 57, 58, 61, 66, 72, 74, 75, 76, 77, 78, and 80, is in error with regard to references to Plaintiff's Exhibit 358, which references should be to Plaintiff's Exhibit 358*. Accordingly, Volume 31 of the record of proceedings is hereby corrected to show that Plaintiff's Exhibit 358* was referred to on the pages listed above and was admitted. The summaries of the final status of the Kansas Exhibits shall reflect that Plaintiff's Exhibit 358* was admitted and shall not include Plaintiff's Exhibit 358.

3. In the record of proceedings held before the Special Master, Volume 35 (December 17, 1990), at page 116 (line 11) and Volume 36 (December 18, 1990), at pages 5, 64 (line 12) and 124 (line 28), are in error with regard to references to Plaintiff's Exhibit 371, which references should be to Plaintiff's Exhibit 371*. Accordingly, Volumes 35 and 36 of the record of proceedings are hereby corrected to show that Plaintiff's Exhibit 371* was referred to and admitted on the pages and lines listed above. The summaries of the final status of the Kansas Exhibits shall reflect that Plaintiff's Exhibit 371* was admitted and that Plaintiff's Exhibit 371 was discussed but not admitted.

4. Plaintiff's Exhibit 389** is hereby admitted into evidence as conforming to the large version of the map entitled "Ditch Service Areas for 1990" testified to by Mr. Frost and discussed by counsel in the record of proceedings before the Special Master in Volume 27 (November

13, 1990) at pages 76-81. Plaintiff's Exhibit 389*, the hand-held version discussed in the same transcript at pages 78-81, shall remain lodged with the Court, but not admitted. Therefore, in the record of proceedings before the Special Master, Volume 27, at pages 19, 46, 76 and 82, shall be modified with regard to references to Plaintiff's Exhibit 389, which references shall be to Plaintiff's Exhibit 389**. The summaries of the final status of the Kansas exhibits shall reflect that Plaintiff's Exhibit 389** was admitted and shall reflect that Plaintiff's Exhibit 389* was the subject of testimony, but not admitted, and shall not include Plaintiff's Exhibit 389.

5. In the record of proceedings held before the Special Master, Volume 27 (November 13, 1990), at pages 19 and 46, is in error with regard to references to Plaintiff's Exhibit 394, which references should be to Plaintiff's Exhibit 394*. Accordingly, Volume 27, at pages 19 and 46, is hereby corrected to refer to Plaintiff's Exhibit 394*. The summaries of the final status of the Kansas Exhibits shall reflect that Plaintiff's Exhibit 394* was the subject of testimony, but not admitted, and shall not include Plaintiff's Exhibit 394.

6. In the record of proceedings held before the Special Master, Volume 27 (November 13, 1990), at pages 19 and 46, is in error with regard to references to Plaintiff's Exhibit 395, which references should be to Plaintiff's Exhibit 395*. Accordingly, Volume 27, at pages 19 and 46, is hereby corrected to refer to Plaintiff's Exhibit 395*. The summaries of the final status of the Kansas Exhibits shall reflect that Plaintiff's Exhibit 395* was the subject of testimony, but not admitted, and shall not include Plaintiff's Exhibit 395.

7. In the record of proceedings held before the Special Master, Volume 27 (November 13, 1990), at pages 19 and 46, is in error with regard to references to Plaintiff's Exhibit 397, which references should be to Plaintiff's Exhibit 397*. Accordingly, Volume 27, at pages 19 and 46, is hereby corrected to refer to Plaintiff's Exhibit 397*. The summaries of the final status of the Kansas Exhibits shall reflect that Plaintiff's Exhibit 397* was the subject of testimony, but not admitted, and shall not include Plaintiff's Exhibit 397.

8. In the record of proceedings held before the Special Master, Volume 27 (November 13, 1990), at pages 19 and 46, is in error with regard to references to Plaintiff's Exhibit 398, which references should be to Plaintiff's Exhibit 398*. Accordingly, Volume 27, at pages 19 and 46, is hereby corrected to refer to Plaintiff's Exhibit 398*. The summaries of the final status of the Kansas Exhibits shall reflect that Plaintiff's Exhibit 398* was the subject of testimony, but not admitted, and shall not include Plaintiff's Exhibit 398.

9. In the record of proceedings held before the Special Master, Volume 27 (November 13, 1990), at pages 19 and 46, is in error with regard to references to Plaintiff's Exhibit 399, which references should be to Plaintiff's Exhibit 399*. Accordingly, Volume 27, at pages 19 and 46, is hereby corrected to refer to Plaintiff's Exhibit 399*. The summaries of the final status of the Kansas Exhibits shall reflect that Plaintiff's Exhibit 399* was the subject of testimony, but not admitted, and shall not include Plaintiff's Exhibit 399.

10. In the record of proceedings held before the Special Master, Volume 27 (November 13, 1990), at pages 19 and 46, is in error with regard to references to Plaintiff's Exhibit 400, which references should be to Plaintiff's Exhibit 400*. Accordingly, Volume 27, at pages 19 and 46, is hereby corrected to refer to Plaintiff's Exhibit 400*. The summaries of the final status of the Kansas Exhibits shall reflect that Plaintiff's Exhibit 400* was the subject of testimony, but not admitted, and shall not include Plaintiff's Exhibit 400.

11. In the record of proceedings held before the Special Master, in Volumes 27 and 28 (November 13 and 14, 1990, respectively), all pages that refer to, and page 95 of Volume 27 that admitted, Plaintiff's Exhibit 401 are in error and should have referred to and admitted Plaintiff's Exhibit 401*. Accordingly, Volumes 27 and 28 of the record of proceedings are hereby corrected to refer to Plaintiff's Exhibit 401*. The summaries of the final status of the Kansas exhibits shall reflect that Plaintiff's Exhibit 401* was admitted and shall not include Plaintiff's Exhibit 401.

12. In the record of proceedings held before the Special Master, in Volume 27 (November 13, 1990), all pages that refer to, and page 102 that admitted, Plaintiff's Exhibit 402 are in error and should have referred to and admitted Plaintiff's Exhibit 402*. Accordingly, Volume 27 of the record of proceedings is hereby corrected to refer to Plaintiff's Exhibit 402*. The summaries of the final status of the Kansas Exhibits shall reflect that Plaintiff's Exhibit 402* was admitted and shall not include Plaintiff's Exhibit 402.

13. In the record of proceedings held before the Special Master, in Volume 27 (November 13, 1990), all pages that refer to, and page 133 that admitted, Plaintiff's Exhibit 403 are in error and should have referred to and admitted Plaintiff's Exhibit 403*. Accordingly, Volume 27 of the record of proceedings is hereby corrected to refer to Plaintiff's Exhibit 403*. The summaries of the final status of the Kansas Exhibits shall reflect that Plaintiff's Exhibit 403* was admitted and shall not include Plaintiff's Exhibit 403.

14. In the record of proceedings held before the Special Master, in Volume 27 (November 13, 1990), all pages that refer to, and page 137 that admitted, Plaintiff's Exhibit 404 are in error and should have referred to and admitted Plaintiff's Exhibit 404*. Accordingly, Volume 27 of the record of proceedings is hereby corrected to refer to Plaintiff's Exhibit 404*. The summaries of the final status of the Kansas Exhibits shall reflect that Plaintiff's Exhibit 404* was admitted and shall not include Plaintiff's Exhibit 404.

15. In the record of proceedings held before the Special Master, in Volume 27 (November 13, 1990), all pages that refer to, and page 140 that admitted, Plaintiff's Exhibit 406 are in error and should have referred to and admitted Plaintiff's Exhibit 406*. Accordingly, Volume 27 of the record of proceedings is hereby corrected to refer to Plaintiff's Exhibit 406*. The summaries of the final status of the Kansas Exhibits shall reflect that Plaintiff's Exhibit 406* was admitted and shall not include Plaintiff's Exhibit 406.

16. In the record of proceedings held before the Special Master, in Volumes 27, 28 and 29 (November 13, 14 and 15, 1990, respectively), all pages that refer to, and page 56 of Volume 27 that admitted, Plaintiff's Exhibit 471 are in error and should have referred to and admitted Plaintiff's Exhibit 471*. Accordingly, Volumes 27, 28 and 29 of the record of proceedings are hereby corrected to refer to Plaintiff's Exhibit 471*. The summaries of the final status of the Kansas Exhibits shall reflect that Plaintiff's Exhibit 471* was admitted and shall not include Plaintiff's Exhibit 471.

DATED: March 11, 1994.

/s/ Arthur L. Littleworth
Arthur L. Littleworth
Special Master

PROOF OF SERVICE BY MAIL

STATE OF CALIFORNIA, COUNTY OF RIVERSIDE

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years and not a party to the within entitled action; my business address is Best, Best & Krieger, 3750 University Avenue, 400 Mission Square, Riverside, California 92502.

I am readily familiar with Best, Best & Krieger's practice for collecting and processing correspondence for mailing with the United States Postal Service. Under that practice, all correspondence is deposited with the United States Postal Service the same day it is collected and processed in the ordinary course of business.

On March 11, 1994, I served the within **ORDER REGARDING PLAINTIFF'S EXHIBITS** by placing a copy of the document in a separate envelope for each addressee named below and addressed to each such addressee as follows:

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On March 11, 1994, at the office of Best, Best & Krieger, 3750 University Avenue, 400 Mission Square, Riverside, California 92502, I sealed and placed each envelope for collection and deposit by Best, Best & Krieger in the United States Postal Service, following ordinary business practices.

I declare under penalty of perjury under the laws of the State of California, that the foregoing is true and correct.

Executed on March 11, 1994, at Riverside, California.

/s/ Sandra L. Simmons
Sandra L. Simmons

(14)

Supreme Court, U.S.
FILED
NOV 17 1994
OFFICE OF THE CLERK

No. 105, ORIGINAL

In The

SUPREME COURT OF THE UNITED STATES
October Term, 1994

STATE OF KANSAS,
Plaintiff,

v.

STATE OF COLORADO,
Defendant,

and

UNITED STATES OF AMERICA,
Defendant-Intervenor.

KANSAS' EXCEPTIONS TO THE 1994 REPORT OF THE SPECIAL MASTER AND BRIEF IN SUPPORT OF EXCEPTIONS

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November 17, 1994

No. 105, ORIGINAL

In The
SUPREME COURT OF THE UNITED STATES
October Term, 1994

STATE OF KANSAS,

Plaintiff,

v.

STATE OF COLORADO,

Defendant,

and

UNITED STATES OF AMERICA,

Defendant-Intervenor.

KANSAS' EXCEPTIONS TO THE 1994 REPORT OF THE SPECIAL MASTER

The State of Kansas takes exception to the following recommendations in the Special Master's 1994 Report:

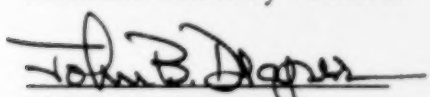
1. That the Court grant Colorado's Motion to Dismiss Kansas' Trinidad Reservoir Claim;

2. That the Court reject Kansas' claim that Colorado's Winter Water Storage Program has violated the Arkansas River Compact; and

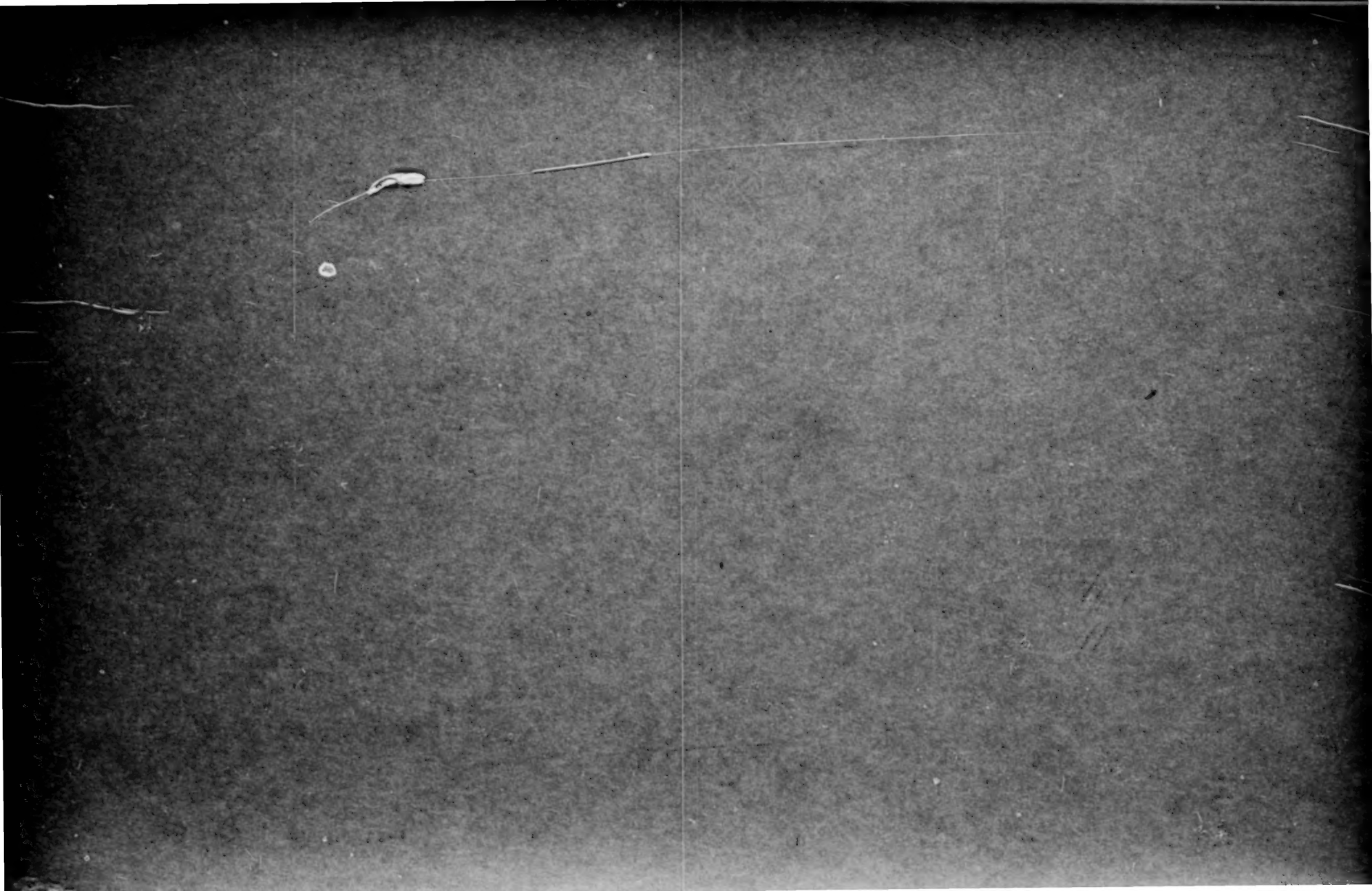
3. That the Court reject Kansas' method for determining the usability of depletions of stateline flows pursuant to Article IV-D of the Arkansas River Compact.

Respectfully submitted,

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JOHN W. CAMPBELL
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KANSAS' BRIEF IN SUPPORT OF EXCEPTIONS

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November 17, 1994

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October Term, 1994

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Plaintiff,

v.

STATE OF COLORADO,

Defendant,

and

UNITED STATES OF AMERICA,

Defendant-Intervenor.

KANSAS' BRIEF IN SUPPORT OF EXCEPTIONS

QUESTIONS PRESENTED

---

1. Did Colorado violate the Arkansas River Compact by refusing to abide by the Trinidad Reservoir Operating Principles adopted by the Arkansas River Compact Administration?

2. Did the Special Master err in rejecting Kansas' claim that Colorado's Winter Water Storage Program has violated the Arkansas River Compact:

   (a) Because he placed the risk of uncertainty resulting from a lack of Colorado data on Kansas; or

   (b) Because he relied on a basis as to which the record was admittedly incomplete?

3. Did the Special Master err under Compact Article IV-D when he chose a long-term averaging method for determining usability and rejected Kansas' daily method?

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JURISDICTION

The State of Kansas invoked the original jurisdiction of the Court under Article III, Section 2, Clause 2 of the United States Constitution and the Judiciary Act, 28 U.S.C. § 1251(a) (1988) on December 16, 1985. Leave to file a bill of complaint was granted by the Court on March 24, 1986.

CONSTITUTIONAL PROVISIONS, STATUTES AND REGULATIONS INVOLVED

This case involves:

1. Article III, Section 2, Clause 2 of the United States Constitution which provides in pertinent part as follows:

> In all Cases affecting Ambassadors, other public Ministers and Consuls, and those in which a State shall be a Party, the supreme Court shall have original Jurisdiction.

2. 28 U.S.C. § 1251(a) (1988) which provides as follows:

> § 1251. Original jurisdiction
> (a) The Supreme Court shall have original and exclusive jurisdiction of all controversies between two or more States.

3. The Arkansas River Compact, 63 Stat. 145 (1949) ("Compact") which is reprinted as Exhibit 1 in the Appendix ("App.") to the Master's 1994 Report ("Rep.") and particularly Articles II, IV-D and VIII-A & -B thereof. Article II provides as follows:

> The provisions of this Compact are based on (1) the physical and other conditions peculiar to the Arkansas River and its natural drainage basin, and the nature and location of irrigation and other developments and facilities in connection therewith; (2) the opinion of the

United States Supreme Court entered December 6, 1943, in the case of *Colorado v. Kansas* (320 U.S. 383) concerning the relative rights of the respective States in and to the use of waters of the Arkansas River; and (3) the experience derived under various interim executive agreements between the two States apportioning the waters released from the John Martin Reservoir as operated by the Corps of Engineers. Rep., App., Ex. 1, at App. 2.

Article IV-D provides as follows:

> D. This Compact is not intended to impede or prevent future beneficial development of the Arkansas River basin in Colorado and Kansas by Federal or State agencies, by private enterprise, or by combinations thereof, which may involve construction of dams, reservoir, and other works for the purposes of water utilization and control, as well as the improved or prolonged functioning of existing works: Provided, that the waters of the Arkansas River, as defined in Article III, shall not be materially depleted in usable quantity or availability for use to the water users in Colorado and Kansas under this Compact by such future development or construction. *Id.*, at App. 5.

Articles VIII-A & -B provide as follows:

> A. To administer the provisions of this Compact there is hereby created an interstate agency to be known as the Arkansas River Compact Administration herein designated as "The Administration."
>
> B. The Administration shall have power to:

(1) Adopt, amend and revoke by-laws, rules and regulations consistent with the provisions of this Compact;

(2) Prescribe procedures for the administration of this Compact: Provided, that where such procedures involve the operations of John Martin Reservoir Project they shall be subject to the approval of the District Engineer in charge of said Project;

(3) Perform all functions required to implement this Compact and to do all things necessary, proper or convenient in the performance of its duties. *Id.*, at App. 11.

4. Trinidad Dam and Reservoir Project Operating Principles and Minutes showing adoption by the Arkansas River Compact Administration on June 6, 1967, which are included in the Appendix to this Brief.

STATEMENT OF THE CASE

This is an action by the State of Kansas to enforce the Arkansas River Compact approved by the legislatures of Kansas and Colorado and by Congress in 1949. After trial, the Master found that increased well pumping in Colorado, Kansas' largest claim, constituted a violation of the Compact, but he ruled against Kansas on several important points.

I. Physical Features.

The Arkansas River rises in the Rocky Mountains near Leadville, Colorado, and flows generally southerly and then easterly through the city of Pueblo, Colorado. From Pueblo it continues eastward across the plains to the Colorado-Kansas state line. After crossing the state line, the river flows eastward to Garden City, Kansas, and through the states of Kansas, Oklahoma and Arkan-

sas, ultimately entering the Mississippi River southeast of Little Rock, Arkansas.

The portion of the river at issue extends from the river's headwaters to Garden City, Kansas. *See* Rep., vol. I, at 35-40. The primary depletions of water in this reach are caused by the irrigation of crops. *See id.* In the portion of the Arkansas River between Pueblo and the state line, the water is applied to some 320,000 acres of irrigated land through diversion and rediversion of surface water and withdrawals from some 2,500 wells along the river. Rep., vol. II, at 203; Pl. Ex. 30, Table 1 (R. vol. 21, at 117, vol. 22, at 21, 30), Pl. App., Item 1.[1]

The three major reservoirs involved in this litigation are (1) John Martin Reservoir, about 58 miles upstream of the state line in Colorado; (2)Pueblo Reservoir at Pueblo, about 130 miles above John Martin Reservoir; and (3) Trinidad Reservoir at Trinidad, Colorado, somewhat more than 160 miles above John Martin Reservoir on the Purgatoire River, a major tributary of the Arkansas River. *See, e.g.*, Rep., vol. I, Map in pocket.

II. The Compact.

In the first half of the twentieth century, Kansas twice petitioned this Court, unsuccessfully, to establish an equitable apportionment of the flows of the Arkansas River and to obtain an injunction against further depletions in Colorado. *See Kansas v. Colorado*, 206 U.S. 46 (1907), and *Colorado v. Kansas*, 320 U.S. 383 (1943). In 1943 the Court recommended that the states resolve their differences by compact under Article I, Section 10, Clause 3 of the Constitution. *Colorado v. Kansas*, 320 U.S. at 392.

In response to this recommendation and in recognition that the states could benefit from the construction of John Martin Res-

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[1] The pages in the record at which an exhibit appears, at which it was offered in evidence, and at which it was ruled on by the Master will be given in parentheses. *See* Sup. Ct. Rule 24.5. "R" refers to the trial transcript of proceedings.

ervoir by the U.S. Army Corps of Engineers, the states negotiated a compact, equitably apportioning the waters of the Arkansas River.[2] *See* Arkansas River Compact, Arts. I, II (Rep., App., Ex. 1, at App. 1-2). The states reached agreement on December 14, 1948, *id.* at App. 16; the legislatures of Colorado and Kansas approved the Compact shortly thereafter; and Congress approved the Compact on May 31, 1949, Act of May 31, 1949, 63 Stat. 145.

The Compact consists of nine articles. In addition to the statements of purpose and basis (Arts. I & II), the Compact includes provisions regarding: Definitions (Art. III); limitations on the scope of the Compact, John Martin Reservoir generally and prohibition of material depletions of the river in usable quantity or availability (Art. IV); operating procedures for John Martin Reservoir (Art. V); jurisdiction (Art. VI); miscellaneous subjects (Art. VII); creation, powers and duties of the Arkansas River Compact Administration ("Compact Administration") (Art. VIII); and sovereignty of the United States and amendment of the Compact (Art. IX).

One of the Compact negotiators' purposes was to maintain the status quo. Rep., vol. I, at 99-102; Jt. Ex. 4, at 12-54 to -55 (R. vol. 5, at 53, 83, 86), Pl. App., Item 10; Jt. Ex. 3, at 13-100 (R. vol. 5, at 53, 83, 86), Pl. App., Item 9; Pl. Ex. 129, vol. II, at 387 (R. vol. 2, at 29, R. vol. 9, at 84, Admitted by written order of 11/16/93), Pl. App., Item 2. The uses already established in Colorado and Kansas were to be preserved but not enlarged, and the benefits of John Martin Reservoir were to be equitably apportioned. These purposes appear in Articles I-B and IV-D.

---

[2] "Waters of the Arkansas River" means the waters originating in the natural drainage basin of the Arkansas River, including its tributaries, upstream from the state line, and excluding waters brought into the Arkansas River Basin from other river basins. Compact, Art. III-B, Rep., App., Ex. 1, at App. 2-3.

III. Colorado's Violations of the Compact.

After the Compact was adopted, Colorado undertook three developments which led to Kansas' claims that Colorado has violated the Arkansas River Compact:

First, Colorado permitted the installation of some 1,500 wells along the river tapping the shallow alluvial aquifer which is in direct hydraulic connection with the river. *See, e.g.*, Pl. Ex. 30, Table 1 (R. vol. 21, at 117, vol. 22, at 21, 30), Pl. App., Item 1; Rep., vol. I, at 113-17. In addition, Colorado allowed increased withdrawals from pre-Compact wells over and above the amounts that had been pumped prior to the Compact. R. vol. 82, at 139, Pl. App., Item 23. Although Colorado was one of the original prior appropriation doctrine states with respect to surface water,[3] it has never effectively regulated the wells in the Arkansas River Valley under the prior appropriation system. R. vol. 18, at 46, Pl. App., Item 20; Rep., vol. I, at 139. If wells had been regulated, most would not have been allowed to pump because they were generally later in priority compared to Colorado surface water rights. In fact, most were installed after the adoption of the Compact. R. vol. 15, at 132-34, Pl. App., Item 19; R. vol. 116, at 69; Pl. App., Item 27.

Second, Colorado sought federal funding for the Trinidad Dam and Reservoir Project, which had been authorized by Congress in 1958, Act of July 3, 1958; Jt. Ex. 35, at 309 (R. vol. 111, at 5, 6), Pl. App., Item 15. In order to obtain the concurrence of Kansas, Colorado agreed to Kansas' demand that the Compact Administration adopt a set of Operating Principles for Trinidad Dam and Reservoir Project ("Operating Principles") (Jt. Ex. 19,

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[3] The "Colorado Doctrine," indeed, was another name for the pure prior appropriation law first enunciated in *Coffin v. Left Hand Ditch Co.*, 6 Colo. 443 (1882); *see* Frank J. Trelease, *Water Law* 10-13, 29 (2d ed. 1974). This is the "first-in-time, first-in-right" legal doctrine governing the allocation of water in most Western states in which water rights are established by application to beneficial use and not by ownership of riparian lands.

June 6, 1967 minutes (R. vol. 17, at 87, 89)), Pl. App., Item 12. The principles had been developed by the U.S. Bureau of Reclamation based on hydrologic studies performed by the Bureau. Rep., vol. III, at 388-89. Once the Compact Administration adopted the Operating Principles, funds were appropriated and the project was built and became operational in 1979. *Id.*, at 395-96. However, as the Master correctly assumed in his report, Colorado violated the Operating Principles within a year after the project began to operate, by storing water that should have flowed downstream to other Colorado and Kansas irrigators. *See* Jt. Ex. 18-32, at 47-48 (R. vol. 20, at 100, vol. 21, at 34, 36), Pl. App. No. 11. The Bureau of Reclamation analyzed the reservoir operations and concluded that what Colorado had done from 1979 through 1984 was "a departure from the intent of the Operating Principles." Jt. Ex. 23, at 55 (R. vol. 17, at 69, R. vol. 18, at 21, 22), Pl. App., Item 13.

Third, in 1976, Colorado initiated the Winter Water Storage Program (WWSP). Rep., vol. II, at 309. The program consists of storing water in Pueblo Reservoir and other off stream reservoirs—water which before 1976 had been diverted onto the fields in Colorado for winter irrigation—and later releasing the stored water to irrigate crops during the summer months. *Id.*, at 308-11.

IV. Procedural History.

After the Court granted Kansas' Motion for Leave to File a Bill of Complaint, Colorado filed its Answer and Counterclaim, denying the allegations of Compact violations and asserting several defenses. Colorado's Counterclaim essentially made two claims: (1) that Kansas had stored water released from John Martin Reservoir in Lake McKinney Reservoir in Kansas in violation of the Compact; and (2) that increased post-Compact pumping in Kansas had depleted the surface water supply in Kansas and had caused Kansas users to make additional demands for releases of water stored in John Martin Reservoir in Colorado, to the detriment of Colorado users. *See* Rep., App., Ex. 3. The United

States intervened and filed an Answer relating to Kansas' Trinidad Reservoir and WWSP claims. *See id.*, at Ex. 4.

Prior to trial, the Master bifurcated the case into a liability phase and a remedies phase. *Id.*, at Ex. 6. Trial before the Master on the liability phase concluded on December 16, 1992. The Master submitted his Report to the Court at the end of July 1994. The Master recommended in the Report that the Court reject the equitable defenses of Colorado, recognize the pre-Compact pumping entitlement of Colorado in the amount of 15,000 acre-feet per year and find a violation of the Arkansas River Compact by the State of Colorado with regard to post-Compact well pumping. Rep., vol. I, at 170, vol. II, at 190-200, 336-37. These recommendations are largely in accord with Kansas' position. The Master recommended, however, that Kansas' usable flow method be rejected and that the other two claims by Kansas (Trinidad and WWSP) be denied. He also recommended that the two Colorado counterclaims (Lake McKinney and post-Compact wells in Kansas) be denied for failure of proof. Rep., vol. II, at 336-37.

During trial, each state presented a hydrologic model showing depletions[4] from post-Compact well pumping and the WWSP on flows at the state line. *Id.*, at 228-90. The depletions calculated by each model were then evaluated to determine the amount of depletions that would have been used in Kansas had they been available. *Id.*, at 291-305. According to Kansas' evidence, the net depletions to usable flow caused by increased Colorado pumping and the WWSP during the period 1950-85 were 489,000 acre-feet. Pl. Ex. 111***[5] (R. vol. 89, at 9, 85, vol. 99, at 5) Rep., App.,

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[4] Depletions are negative effects on river flows. Depletions of usable flow are negative effects on river flows that would have been diverted by canals for irrigation or that would have recharged a groundwater aquifer. Accretions are positive effects on river flows. "Net" depletions are the depletions that remain after offsetting the effects of transmountain water imported to the Arkansas Basin from the Colorado Basin. Depletions of usable flow at the state line mean less water available to Kansas water users, a result the Compact was intended to prevent.

[5] Asterisks indicate revised versions of exhibits.

Ex. 11. The Master's usable flow method would reduce Kansas' claim by 124,000 acre-feet (25%). Rep., vol. II, at 303. Almost all of the difference in the results of the two methods arises in the period 1975-[illegible], when the effects of a major drought were felt in Kansas, with stateline flows severely reduced and no flows at all for long periods at Garden City. Pl. Ex. 698 (R. vol. 127, at 127, 146), Pl. App., Item 5; Rep., vol. I, at 142; R. vol. 109 at 68-69, Pl. App., Item 25.

Kansas also submitted evidence on the violation of the Trinidad Reservoir Operating Principles from 1979 through 1984, based in large part on a 1988 Report of the Bureau of Reclamation.[6] *See* Rep., vol. III, at 409-10. The Bureau found that the Operating Principles had been departed from, and it performed certain computer modeling studies to quantify the effect of the departure from the Operating Principles on John Martin Reservoir. Jt. Ex. 23, at 55 (R. vol. 17, at 69, vol. 18, at 21, 22), Pl. App., Item 13. Before Colorado offered any evidence, the Master dismissed Kansas' claim because Kansas had not submitted evidence comparing actual operations with "no-project" conditions, an analysis that the Bureau had said was impossible. Jt. Ex. 23, at 26 (R. vol. 17, at 69, vol. 18, at 21, 22), Pl. App., Item 13.

On October 3, 1994, the Court received the Report, ordered it filed and set the schedule for exceptions and briefing. Kansas' Exceptions are submitted in accordance with that schedule.

SUMMARY OF ARGUMENT

I. Trinidad Reservoir Operating Principles.

The Master erred in allowing Colorado to disregard the Trinidad Operating Principles with impunity. The Operating Principles were officially adopted by the Compact Administration with the unanimous approval of the compacting states. Such approval was necessary in order for the project to be built. In return for

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[6] Neither state agreed in all respects, however,with the 1988 Bureau Report. *See*, Rep., vol. III, at 378, 396, 403.

this essential approval of the project, Colorado agreed to a method of assessing compliance with Article IV-D of the Compact. The Master's decision deprived Kansas of the benefit of this valid exercise of authority by the Compact Administration, while leaving intact the benefit Colorado received.

This Court has made it clear that unanimous decisions of interstate compact agencies, acting within the scope of their congressionally ratified powers, are binding and that it is improper to use this Court's original jurisdiction to redecide such issues. This Court has enforced such a resolution in the past. *See Texas v. New Mexico*, 462 U.S. 554 (1983). If resolutions of interstate compact agencies have no effect, the compacting states will refuse to adopt cooperative resolutions such as the Trinidad Operating Principles. Moreover, this Court should enforce detailed procedures adopted for the purpose of maintaining the Article IV-D standard.

II. Winter Water Storage Program (WWSP).

The Master decided that there was too much uncertainty in the evidence offered by Kansas to prove its claim regarding Colorado's Winter Water Storage Program. The major cause of such uncertainty was the lack of data which needed to have been collected in the past. The Master effectively placed the risk that there might be such uncertainty on Kansas. However, that is a burden that Kansas cannot possibly satisfy. Rather, the risk that there might be such uncertainty should be on the state that proceeded with the project without either (1) performing sufficient studies and collecting sufficient data to assure compact compliance or (2) agreeing to appropriate limitations necessary to insure compliance with Article IV-D of the Compact, as occurred for the Trinidad Project. That risk should have been placed on Colorado, the state benefitting from the program, not Kansas. Kansas had no way of collecting that data in 1976. It has no way of collecting that data today. The onus of not having collected that data should be on the state benefitting from the development and controlling the collection of the necessary data.

The Master also erred in rejecting the Kansas WWSP claim because he relied on an assumption that accretions might be offset against depletions that Kansas' evidence showed had occurred. Such reliance was incorrect because he found, and it is undisputed, that more evidence was needed to determine whether accretions should be offset against depletions. It was error to reject a claim on an admittedly incomplete record.

III. Usability of Stateline Depletions.

Generally stated, usability is the extent to which river flows (1) were, or would have been divertible at times when water is needed for irrigation or (2) were or could have been recharged to a groundwater aquifer. The method for determining usability adopted by the Master is contrary to Article IV-D of the Compact, which requires that the waters of the Arkansas River shall not be materially depleted in usable quantity or *availability for use* to the water users of Colorado and Kansas. Article IV-D embodies the basic understanding that the usability of waters crossing the state line can vary in time and amount. Therefore, techniques for analyzing usability which do not account for its variability in time and amount should be avoided to the maximum extent possible. The method chosen by the Master clearly does not do that. It averages usability not just over a week or a month, but over the whole study period of 36 years, 1950-85. If a more precise alternative to such an averaging method is available, it should be used to ensure compliance with Article IV-D of the Compact.

There is an alternative to the Master's averaging method. There is a method that recognizes the day-to-day variability of usability, namely, Kansas' usable flow method. Yet the Master rejected Kansas' method. He did so on three grounds, two of which are not related to the averaging method at all, but rather relate to questions of uncertainty that he had with respect to the separate hydrologic modeling. Any problems that he perceived with the hydrologic modeling should not have caused him to reject the better and separate method for determining usability. The third ground is merely Colorado's unproved allegation that post-Compact well

pumping in Kansas has increased usability in Kansas beyond pre-Compact levels. The same evidence is required to support that allegation as was required to support the related Colorado counterclaim, which alleged that well depletions in Kansas had increased usability in Kansas and had caused increased calls for releases from John Martin Reservoir. The Master correctly recommended that that counterclaim be dismissed for failure of proof.

ARGUMENT

I. Colorado Has Violated the Arkansas River Compact by Admittedly Refusing to Abide by the Trinidad Reservoir Operating Principles.[7]

A. History of the Operating Principles.

The Master rejected Kansas' claim that violation of the Compact Administration's duly adopted Trinidad Reservoir Operating Principles constituted a violation of the Compact. Kansas presented evidence showing a violation of the Operating Principles and the resulting depletions to John Martin Reservoir conservation storage, part of which is allocated to Kansas under Article V of the Compact. *See* Pl. Ex. 580 (R. vol. 18, at 18), Pl. App., Item 3; R. vol. 18, at 9-10, 16-17, Pl. App., Item 20. The Master held that the Kansas evidence was insufficient because it did not compare the actual operations to pre-Compact conditions. Rep., vol. II, at 426. Departure from the Operating Principles is *ipso facto* a violation of the Compact, and it was entirely sufficient, for purposes of quantifying the effects of the violation, to compare the actual operation with simulated operation as it should have been under the Operating Principles.

Trinidad Reservoir is located just above the city of Trinidad, Colorado, in the southeastern part of the state near the New Mex-

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[7] This portion of the Brief relates to the Decision Of Special Master On Colorado's Motion To Dismiss Kansas' Trinidad Reservoir Claim. Rep., vol. III, at 373. The Master has requested that this decision be confirmed by the Court. Rep., vol. II, at 336.

ico border. The reservoir is an onstream reservoir on the Purgatoire River, which is the major tributary of the Arkansas River between Pueblo and John Martin Reservoir. The Purgatoire enters the Arkansas just above the reservoir. *See* Rep., vol. I, Map in pocket. When the project was authorized in 1958, it was recognized that operating limitations would have to be placed on the reservoir to insure compliance with the Compact. *See* Jt. Ex. 35, at 309 (R. vol. 111, at 5, 6), Pl. App., Item 15; Jt. Ex. 34, at 3-4, ¶ 97, at 29, ¶ 144, at 40 (R. vol. 17, at 77, 89), Pl. App., Item 14.

The Bureau of Reclamation thereafter undertook studies, completed in 1961 and 1964, on the basis of which it proposed the Operating Principles. Rep., vol. III, at 388-89. The Operating Principles were reviewed and approved by the Corps of Engineers, the Colorado Water Conservation Board and the Purgatoire River Water Conservancy District. In response to previous correspondence, H. P. Dugan, Regional Director of the Bureau of Reclamation, wrote to the Governor of Kansas on February 1, 1967, stating, in part:

> We are pleased to learn that the Kansas Water Resources Board, on the basis of our report on the irrigation function of the proposed Trinidad Project and additional information furnished by our representatives, has concluded essentially that *the proposed Trinidad Project will not materially deplete the water supply of the Purgatoire River and John Martin Reservoir providing the project is operated in strict conformity with the guidelines used in the Trinidad Project investigations and the "Operating Principles"* contained in the Bureau's Trinidad Irrigation Report.
> *We wish to assure you that the Bureau of Reclamation* in its planning investigations for the proposed Trinidad Project and in developing the "Operating Principles" therefor has been fully aware of and *has diligently and conscientiously endeavored to implement the provisions*

> *of the Arkansas River Compact* so that the interests of the State of Kansas at all times will be fully protected consistent with the provisions of the Arkansas River Compact. Jt. Ex. 44, at 1 (R. vol. 17, at 82, 89), Pl. App., Item 16. (Emphasis added.)

The Governor of Kansas subsequently requested that the Operating Principles be adopted by the Arkansas River Compact Administration. Jt. Ex. 45 (R. vol. 17, at 86, 89), Pl. App., Item 17. This was done by unanimous consent on June 6, 1967. *See* Jt. Ex. 19, June 6, 1967 minutes (R. vol. 17, at 87, 89), Pl. App., Item 12. The Operating Principles were thereby promulgated as an official action of the Compact Administration in furtherance of its mandate to implement the Arkansas River Compact. Colorado agreed to the Operating Principles in the forum provided by the Compact Administration. *See id.*; Jt. Ex. 99, at 1-2 (R. vol. 94, at 24; Admitted by Written Order of 11/16/93), Pl. App., Item 18.

Upon the Compact Administration's approval of the Operating Principles, Congress enacted legislation to provide funding, and the project was built. Rep., vol. III, at 394-95. At the first opportunity to store more water than was allowed by the Operating Principles, however, Colorado permitted the Trinidad Project to do so. Specifically, the water retained in the reservoir from 1979 was not counted against the water stored in 1980 as it should have been, resulting in the storage of water in 1980 that should have been allowed to flow downstream to other users, including Kansas users (a process known as "rollover"). Kansas immediately asserted before the Compact Administration that Colorado had violated the Compact. *See* Jt. Ex. 18-32, at 47-48 (R. vol. 20, at 100, vol. 21, at 34, 36), Pl. App., Item 11. Also, Colorado permitted the storage of winter flows in the reservoir outside the reservoir storage right, with the same effect that water was stored which should have been passed to downstream users, including Kansas users. *See* R. vol. 18, at 9-10, Pl. App., Item 20. Kansas' assertion that these actions violated the Operating Principles was

accepted by the Master for purposes of Colorado's Motion to Dismiss (Rep., vol. III, at 378), which is consistent with the conclusions of the Bureau of Reclamation that rollover and the unauthorized storage of winter water each constitute "a departure from the intent of the Operating Principles." Jt. Ex. 23, at 55 (R. vol. 17, at 69, vol. 18, at 21, 22), Pl. App., Item 13. The Bureau determined that Colorado's failure to abide by the intent of the Operating Principles resulted in average annual depletions of inflows into John Martin Reservoir totalling 11,600 acre-feet for the period 1979-84. *Id.*, at Table 4, Pl. App., Item 13. The Kansas evidence, based on monthly depletions rather than annual averages, showed such depletions to be as high as 27,500 acre-feet for the period 1979-84.[8] Pl. Ex. 580 (R. vol. 18, at 18), Pl. App., Item 3.

B. This Court Should Honor a Unanimous Decision of the Arkansas River Compact Administration.

The Master has accepted Colorado's argument that official action of the Arkansas River Compact Administration is not effective to set procedures for operation of Trinidad Reservoir necessary to comply with the Compact. It was the Master's position that Kansas cannot rely on the official action of the Compact Administration in adopting the Operating Principles but must prove anew in this Court that operation of Trinidad Project in violation of the Operating Principles caused stateline flows to be materially depleted in usable quantity or availability for use. The Master's position requires that the original jurisdiction of this Court be burdened by trial and proof on an issue already decided by the Arkansas River Compact Administration, a body created by the Arkansas River Compact and empowered to implement that Compact.

In *Texas v. New Mexico*, 462 U.S. 554 (1983), this Court addressed a similar question with regard to the Pecos River Com-

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[8] Kansas generally received 40% of inflows to John Martin Reservoir during the study period. *See* Rep. vol. I, at 47.

pact (Act of June 9, 1949, ch. 184, 63 Stat. 159) and the relationship between the Pecos River Commission and this Court. The Court described the Pecos River Commission as follows:

> The Compact also established the Pecos River Commission as a permanent body, in more or less the same form that it had during the negotiations on the Compact. It was to have three Commissioners, one from each State and one representing the United States, but the United States representative could not vote. Art. V(a). Accordingly, the Commission could take official action only with the concurrence of both state Commissioners. The Commission was given broad powers to make all findings of fact necessary to administer the Compact, Arts. V(d)(5)-(10), as well as to"[e]ngage in studies of water supplies of the Pecos River" and to "[c]ollect, analyze, correlate, preserve and report on data as to the stream flows, storage, diversions, salvage, and use of the waters of the Pecos River and its tributaries," Arts. V(d)(3), (4). 462 U.S., at 560.

The Arkansas River Compact Administration is almost identical to the Pecos River Commission. The Arkansas River Compact Administration is also a permanent body established by the Arkansas River Compact in more or less the same form that the Arkansas River Compact Commission had during the negotiations on the Compact. *See* Compact Preamble, Art. VIII, Rep., App., Ex. 1, at App. 1, 11-15. Instead of one commissioner from each state and one representative of the United States, each state has three representatives, and there is one federal representative. *Id.*, at App. 12. However, exactly like the Pecos River Compact Commission, each state has but one vote, and the federal representative cannot vote. *Id.* The Compact Administration can take official action only with the concurrence of both states. *Id.* The Compact Administration may make findings of fact, although, just like the Pecos River Commission, such findings "shall not be con-

clusive in any court, or before any agency or tribunal but shall constitute prima facie evidence of the facts found." *Id.*, at App. 15; Pecos River Compact, Art. V(f), 63 Stat. at 163. Also like the Pecos River Commission, the Compact Administration is authorized to engage "in the systematic determination and correlation of the facts as to the flow and diversion of the waters of the Arkansas River" and "the procurement, interchange, compilation and publication of all factual data bearing upon the administration of this Compact. . . ." Compact Art. VIII-G, Rep., App., Ex.1, at App. 14.

The Court described New Mexico's contention with respect to the relationship of this Court to the Pecos River Commission as follows:

> It contends that this Court may do nothing more than review official actions of the Pecos River Commission, on the deferential model of judicial review of administrative action by a federal agency, and that this case should be dismissed if we find either that there is no Commission action to review or that the actions the Commission has taken were not arbitrary or capricious. Thus, in New Mexico's view, this suit may be maintained only as one for judicial review of the Commission's quantification of the 1950-1961 shortfall,[9] and the implied acceptance of the Review of Basic Data which, New Mexico argues, that entailed. According to New Mexico, "[this] Court has no authority to act *de novo*

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[9] This language refutes the Master's assertion in the case now at bar that "the Court did nothing more than go along with a unanimous finding of the Commission as to river flow depletions for certain years." Rep., vol. III, at 420-21. That the Commission's quantification was a contested issue is further borne out by one of New Mexico's "Questions Presented" in that case: "Whether the Court should review findings of fact the Commission made in 1962 . . . ." New Mexico's Brief in Support of Exceptions at i (Dec. 2, 1982), *Texas v. New Mexico*, 462 U.S. 554 (1983) (No. 65, Original), Pl. App., Item 30.

> or assume the powers of the Pecos River Commission." . . . We disagree. 462 U.S. at 566-67 (footnote added).

In the course of its emphatic response to New Mexico's position, the Court stated the following:

> Considerations outside the Compact itself also render New Mexico's theory of the role of this Court untenable. According to New Mexico, Texas may seek judicial review in this Court of decisions actually made by the Commission—presumably on the votes of both State's Commissioners. That is not the proper function of our original jurisdiction to decide controversies between two States. In recent years, we have consistently interpreted 28 U.S.C. § 1251(a) as providing us with substantial discretion to make case-by-case judgments as to the practical necessity of an original forum in this Court for particular disputes within our constitutional original jurisdiction. . . . . We exercise that discretion with an eye to promoting the most effective functioning of this Court within the overall federal system . . . . *If authorized representatives of the compacting States have reached an agreement within the scope of their congressionally ratified powers, recourse to this Court when one State has second thoughts is hardly "necessary for the State's protection," Massachusetts v. Missouri*, 308 U.S. 1, 18 (1939). Absent extraordinary cause, we shall not review the Pecos River Commission's actions without a more precise mandate from Congress than either the Compact or 28 U.S.C. § 1251 provides. 462 U.S. 554, 570-71 (1983) (emphasis added; footnote and citations omitted).

In a footnote to this passage, the Court said, in part:

> *When it is able to act, the Commission is a completely adequate means for vindicating either State's interests.* The need for burdensome original jurisdiction litigation, which prevents this Court from attending to its appellate docket, would seem slight. *Id.* at 571 n. 18 (emphasis added).

Here, the authorized representatives of the compacting states (the Colorado and Kansas Compact Administration members) have reached an agreement (the Operating Principles) within the scope of their congressionally ratified powers (to implement and prescribe procedures under Article VIII-B). Therefore, recourse to this Court by Colorado is hardly necessary for Colorado's protection. In this action, Colorado has not requested that the Court review the action of the Compact Administration adopting the Operating Principles, let alone shown "extraordinary cause" for granting such a request. Further, the Court has held that when the Compact Administration is able to act, as occurred in its adoption of the Operating Principles, the Administration is a completely adequate means for vindicating Colorado's interest, and resort to this Court's original jurisdiction on the subject of the agreement, namely, the Operating Principles, is not needed.

Article VIII-A of the Compact creates the Compact Administration and Article VIII-B empowers the Compact Administration to adopt regulations, prescribe procedures and perform all functions required to implement the Compact. Article VIII also provides for the membership of the Compact Administration: water right owners from specified areas within the basin and the chief water officials of each state. In addition, considerable expertise is made available to the Administration through the water agencies of the two states and the federal government. The Compact Administration is clearly invested with considerable access to technical expertise in making decisions such as the one it made on June 6, 1967, when it adopted the Operating Principles.

The Master decided that "the Compact Administration did not do, nor intend to do, what Kansas now claims." Rep., vol. III, at

414. He further stated, "I find nothing to indicate that the Compact representatives of either State thought they were exercising binding authority under Article VIII-B." *Id.*, at 415. The Master appears to rest this conclusion on the fact that the Bureau of Reclamation was the body which developed the Operating Principles and that the Operating Principles had been widely accepted by other parties prior to being voted on by the Compact Administration. *See id.*, at 414. He also seems to have based it on the approval of the Governor of Kansas subject to the acceptance of the Operating Principles by the Compact Administration, and the fact that the primary subject of discussion at the meeting at which they were adopted was the set of additional conditions requested by Kansas. *Id.*, at 414-15. These are odd grounds to cite as a basis for determining the intentions behind governmental action. The primary source for determining the Compact Administration's intent should be the terms of the promulgation itself. *See, e.g., Negonsott v. Samuels*, 113 S. Ct. 1119, 1122-23 (1993), *Reeves v. Ernst & Young*, 113 S. Ct. 1163, 1169 (1993).

The Operating Principles themselves refute the Master's conclusion. The first sentence of the document provides as follows:

> The Trinidad Dam and Reservoir Project as reported in House Document No. 325, 84th Congress, 2d Session, and as authorized by the Flood Control Act of 1958, will be operated in such a manner as to secure the greatest practicable benefits from the regulation and use of the flows of the Purgatoire River consistent with the laws and policies of the State of Colorado and of the United States including the Arkansas River Compact. Jt. Ex. 19, June 6, 1967 minutes (R. vol. 17, 87, 89), Pl. App., Item 12, at A-52 to -53.

These are clearly mandatory words—"The Project . . . will be operated in such a manner. . . ." These are not words of mere courtesy or advice. These words show an intent on the part of the governmental body adopting them that they are mandatory

and expected to be enforceable. The substantive provisions are expressed in the same imperative language. For example, Article III on Flood Control provides, in pertinent part, as follows:

> Trinidad Reservoir shall be operated for flood control benefits in accordance with regulations prescribed by the Secretary of the Army and the following operating principles:
>
> 1. All potentially damaging flood inflows shall . . . .
> 2. All flood waters stored in the flood control capacity shall . . . .
> 3. Any inflow, other than that stored for irrigation use, temporarily retained below the bottom of the flood control capacity for flood control purposes shall . . . . *Id.*, at A-56 (emphasis deleted).

Article IV-Irrigation is no less mandatory:

> Administration of the irrigation capacity in Trinidad Reservoir and the distribution of water to the District Irrigable Area will be made by the District in accordance with House Document No. 325, 84th Congress, 2d Session, and these operating principles. . . .
>
> A. . . .
>
> 1. The water users within the District shall assign . . . .
>
> 2. Waters of the Purgatoire River shall be stored . . . .
>
> B. . . .
>
> 1. The acreage irrigated by the District water supply shall be limited . . . .
> 2. All water deliveries to the 19,717 acres of the District irrigable area will be limited . . . .

> 3. No water deliveries for irrigation of the 19,717 acres of the District irrigable area will be made . . . . *Id.*, at A-56 to -59 (emphasis deleted).

This listing of mandatory terms could be continued through every operative provision of the Operating Principles. Thus, the strongest evidence, the document itself, consists entirely of terms that are not merely directory or advisory, but mandatory, showing a self-conscious exercise of binding authority by the Compact Administration.

The sources to which the Master resorted to support his conclusion are unpersuasive. The fact that the wording was not generated within the Compact Administration itself is not persuasive. Governmental entities borrow language from documents and enactments generated by other governmental bodies. The sharing of such ideas is common in the federal system. The rules of civil procedure of the federal and state judiciaries are an immediate example. The enactment of uniform laws among the states is a manifestation of another kind of intergovernmental sharing of statutory provisions. No one suggests that the promulgation of such provisions is any less binding because of the source of the language in those provisions. Nor are they denigrated on the basis that other governmental entities have accepted those same provisions.

The Master also refers to the "prior" approval of the Governor of Kansas. However, it is clear that the approval of the Governor of Kansas was contingent upon the acceptance of the Operating Principles by the Compact Administration. *See* Jt. Ex. 45 (R. vol. 17, at 86, 89), Pl. App., Item 17. If the adoption of the Operating Principles by the Compact Administration was a useless act as the Master suggested, there would have been no reason for the Governor of Kansas to insist upon that act. Prior approval by other governmental entities would not be expected to deprive a subsequently acting governmental entity of the intent expressed in the enactment itself.

The Master also seemed to take comfort from his assertion that the primary subject of discussion at the Compact Administration meeting at which the Operating Principles were adopted was the inclusion of the five additional Kansas conditions. This is contrary, however, to the suggestion of the chief Colorado representative on the Compact Administration when he introduced the issue: "Mr. Sparks was asked to present the Trinidad Project for consideration. He said the project had been before the Administration for a long time and he asked if Kansas had any further questions on the project." Jt. Ex. 19, June 6, 1967 minutes (R. vol. 17, at 87, 89), Pl. App., Item 12, at A-50. The fact that the project had been before the Administration for a long time belies the Master's suggestion that the only thing of interest to the Administration was the set of additional Kansas conditions. Those were simply the last addition to the Operating Principles and therefore a natural subject of discussion. The reference to the possibility of "further questions" from Kansas also suggests previous discussions, whether on or off the record, concerning the project. Indeed, the issue of the Trinidad Project, operating principles and the appropriate form of Commission action had been before the Compact Administration for many years. *See* Rep., vol. III, at 386-87; Jt. Ex. 34, ¶ 144, at 40 (R. vol. 17, at 77, 89), Pl. App., Item 14.

This Court drew a strong distinction in *Texas v. New Mexico* between review of a compact commission's decision where there had been affirmative and unanimous action by the commission and the absence of commission action. *See* 462 U.S. at 566-71. The Court continued this distinction more recently in *Oklahoma v. New Mexico*, 501 U.S. 221 (1991). There the Court rejected a Master's recommendation to remand to the Canadian River Commission a question which had not already been determined by a unanimous decision of the commission. The Court rejected the recommendation saying that "this Court must pass upon every question essential" to a determination of a controversy between the states. 501 U.S. at 241. Here, however, adoption of the Trinidad Reservoir Operating Principles constitutes a prior and unan-

imous decision of the Compact Administration, so the very predicate of the Court's ruling in *Oklahoma v. New Mexico* is lacking.

C. Kansas and Other States Need To Be Able To Rely on Unanimous Actions of Interstate Compact Agencies.

The question involved here is one of principle that will determine for the indefinite future whether Kansas can rely on resolutions of the Arkansas River Compact Administration relating to details of compliance with the Arkansas River Compact. The direction that Kansas receives from the Court will also serve as a guide to other states and other interstate compact commissions and administrations.

The language of the Compact indicates that the states generally should implement the Compact through joint action of the Arkansas River Compact Administration. *See* Compact Art. VIII, Rep., App., Ex. 1, at App. 11-15. Certainly there is no indication that violations could be shown and resolved only by resort to the original jurisdiction of this Court.

As a practical matter, if the compacting states cannot rely on unanimous resolutions of the interstate compact agency charged with implementing a compact, such as resolutions setting standards for operation of new facilities to insure compliance with a compact, the willingness of compacting states to agree to such resolutions will be reduced. As the Master recognized, this federal project would not have been funded by Congress absent the concurrence of Kansas. Rep., vol. III, at 431. Moreover, the U.S. Bureau of Reclamation assured Kansas that the Operating Principles would implement the Arkansas River Compact and would be strictly complied with. *See* Jt. Ex. 44, at 1 (R. vol. 17, at 82, 89), Pl. App., Item 16. In order for useful projects to be considered in the future, therefore, at least where they involve federal resources or property, the concurrence of the downstream state is necessary. If such cooperation is to be forthcoming, the downstream state will need to be able to rely on commitments by the upstream state. The Master's decision would thwart that process.

D. Enforcement of the Operating Principles Will Not Modify the Compact.

An interstate compact adopted under Article I, Section 10, Clause 3 of the United States Constitution cannot be changed by the interstate agency created by the compact. *See, e.g., Texas v. New Mexico*, 462 U.S. 554, 564-65 (1983). The Master's primary concern in denying the Kansas claim was that the Compact not be altered through the actions of the Compact Administration. *See* Rep., vol. III, at 421.

The Master's concern is unjustified. The Operating Principles were proposed by the U.S. Bureau of Reclamation and adopted by the Arkansas River Compact Administration in the belief that they were necessary to implement and prevent violation of the Arkansas River Compact, particularly Article IV-D. *See* Jt. Ex. 44, at 1 (R. vol. 17, at 82, 89), Pl. App., Item 16. The Master agreed that the Operating Principles were expected to provide protection against material depletion of usable flow under Article IV-D. Rep., vol. III, at 425-26. Far from altering the Compact, the Operating Principles carry out the intent of the Compact and ensure compliance with it.

The Master assumed that enforcement of the Operating Principles would bestow benefits on Kansas, contrary to the purposes of the Trinidad Project. Rep., vol. III, at 424-25. The only evidence, however, that might be thought to support such a conclusion was the 1988 study by the Bureau of Reclamation of the 1925-57 period. *See* Rep., vol. III, at 401; Jt. Ex. 23, at 28-29 (R. vol. 17, at 69, R. vol. 18, at 21, 22), Pl. App., Item 13. The Bureau itself never drew such a conclusion. The 1925-57 period is not the period of operation (1979-84). When Colorado analyzed the Winter Water Storage Program by similarly analyzing a period when the Program was not in operation, the Master rejected the evidence. *See* Rep., vol. II, at 317-18. There the Master recognized that the period of analysis can make a significant difference in the effect of the program because of differing hydrologic and

institutional conditions. *See* Rep., vol. II, at 318.[10] The same conclusion is applicable to selection of a suitable study period to analyze the Operating Principles. The suitable period is obviously the only period of operation, 1979-84. No such analysis has been performed. Therefore, the Master's conclusion is of doubtful validity.

II. Colorado's Winter Water Storage Program Has Violated the Arkansas River Compact.

A. Introduction.

The Master recommended that Kansas' WWSP claim be denied because (1) it is too uncertain and (2) accretions might offset depletions. Rep., vol. II, at 329-35. For several reasons, the WWSP claim should not be rejected. The Kansas experts determined there was a violation in the amount of 40,000 acre-feet of depletions to usable flow during the operation of the program (1976-85). Pl. Ex. 111"" (R. vol. 89, at 9, 85, vol. 99, at 5), Rep., App., Ex. 11. No other evidence of depletions or lack thereof was submitted for the 1976-85 period of operation. Colorado analyzed a different period, when the program was not operating. Rep., vol. II, at 317. Yet even with several favorable assumptions, Colorado also found depletions of total flow, in excess of 9,000 acre-

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[10] The Master sought to justify his use of averages to assess the Bureau of Reclamation's study results on the basis that Kansas did not object to the use of averages to evaluate the 1961-64 Bureau of Reclamation studies. Rep., vol. III, at 426-28. On the one hand, he said that Colorado is not bound by the Operating Principles; on the other, he said that Kansas is bound by references to averages that do not even appear in the Operating Principles. *See id.*; Operating Principles, Pl. App., Item 19. Moreover, there is little logic in the Master's position that use of averages to determine whether to adopt the Operating Principles dictates that departures from the Operating Principles should also be quantified using averages, especially in light of the denigration of averages in *Colorado v. Kansas*, 320 U.S. 383, 396-97 (1943) and the emphasis in Article IV-D on "availability for use."

feet. *Id.*, at 318. The Master rejected the evidence of depletions, however, holding that the results are too uncertain, placing the onus of uncertainty on Kansas, yet it was Colorado that obtained the benefits of the WWSP; it was Colorado that unilaterally initiated the WWSP without the benefit of prior sufficient studies and data collection now found necessary by the Master. Rep. vol. II, at 334-35. Kansas should not be penalized for a situation created by Colorado and from which only Colorado received benefits.

The Winter Water Storage Program has been operating in Colorado since 1976, a period of approximately 18 years. *Id.*, at 309. The period of operation for which evidence is before the Court is 1976-85 (except 1978—a year in which the program did not operate). *Id.* Common sense leads to the conclusion that putting water on the fields in the heat of summer results in more evaporation and other losses than irrigating fields without crops in the cold of winter. Indeed, the hydrologic modeling performed both by Kansas and Colorado shows that the WWSP causes depletions under widely varying hydrologic conditions. *See id.*, at 316, 318. The Kansas evidence indicates that during the nine years of the WWSP's operation, the program caused depletions at the state line of 53,000 acre-feet, of which 40,000 were usable under-Kansas' usable flow method. Pl. Ex. 111*** (R. vol. 89, at 9, 85, vol. 99, at 5), Rep. App., Ex. 11.[11] Colorado, simulating the WWSP in that part of the study period in which the WWSP did not operate (1950-75 and 1978), also found depletions, as described below. The United States took two positions. *See* Rep., vol. II, at 318-22. The Bureau of Reclamation official called by the United States testified that he believed the program did comply with the Compact. Rep., vol. II, at 320-21. On the other hand, the expert witnesses called by the United States took the position

[11] Under the usable flow method accepted by the Master, the corresponding usable depletions for the period 1976-85 are 27,000 acre-feet. Rep., vol. II, at 316 n.134.

that it was impossible to determine whether or not the program complied with the Compact. *See* Rep., App., Ex. 9, at App. 103.

Given this state of the evidence, the Master attempted to apply the preponderance of the evidence test. Rep., vol. II, at 335. In effect, he said that it was more likely than not that there were no material depletions of usable flow as a result of the WWSP. Despite sizeable depletions determined by the Kansas model (53,000 acre-feet) and smaller but not immaterial depletions under different hydrologic conditions determined by the Colorado model, the Master in effect found it was still more likely that there were no depletions at all. This is an inherently implausible result.

B. The Master Erred in Placing the Risk of Uncertainty Resulting From Lack of Data on Kansas.

With regard to the WWSP, the Master concluded "that the depletions shown by the Kansas model are well within the model's range of error." Rep. at 334-35. The Master mistakenly assumed that this fact rendered the claim negligible. The depletions calculated by the Kansas model caused by the Colorado Winter Water Storage Program are 53,000 acre-feet. Pl. Ex. 111*** (R. vol. 89, at 9, 85, vol. 99, at 5); Rep., App., Ex. 11, at App. 118. The range of error associated with the figure 53,000 acre-feet is very difficult to quantify, and no one has attempted to do so.[12] R. vol. 127 at 117-19, Pl. App., Item 28. During cross-examination, the lead Kansas expert was asked to estimate the range of error. He estimated it to be less than ± 50%. R. vol. 128, at 107-08, Pl. App., Item 29. If it were as much as ± 50%, the range of error would be 53,000 ± 26,500 acre-feet. A depletion of 26,500 is

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[12] The uncertainty quantified in the Report is not the uncertainty of calculated depletions. The Report quotes evidence of uncertainty in the prediction of stateline flows, a very different quantity. Rep., vol. II, at 323-25; R. vol. 127, at 117-19, Pl. App., Item 28. It amounts to a precise answer to the wrong question. The evidence simply does not support the finding that 53,000 acre-feet is within the uncertainty of the model.

certainly material, and 79,500 acre-feet is obviously even more so.[13]

None of the experts deny that there is uncertainty with respect to the modeling results of either state. Much of the source of the uncertainty in the WWSP analysis is the lack of adequate data. R. vol. 127, at 118-19, Pl. App., Item 28. The risk of the lack of adequate data should be borne by the state that initiates and benefits from post-Compact development without collecting the data within its jurisdiction or doing the studies needed to support a good faith belief that the development will comply with the Compact.

The Master effectively held in favor of Colorado, the upstream state that initiated the WWSP without sufficient studies, the state that benefitted from this development, and the state that had effective control over the collection of data. He placed the risk of uncertainty in the modeling results, which was caused by the lack of data, squarely on Kansas, the downstream state. *See* Rep., vol. II, at 329-35. Yet Colorado proceeded with the WWSP without collecting the data or doing the studies needed to support a good faith belief that this development would comply with the Compact.[14] And Colorado, as a practical matter, has had control over (1) existing data in Colorado and (2) the determination whether to collect additional data that may be needed. Colorado literally controls the amount of data available. It is sovereign within its borders, and while the Arkansas River Compact allows for cooperative gathering of data relevant to the Compact (*see* Art. VIII), no Administration action can be taken without the concurrence of Colorado. *See id.*

Kansas has presented evidence based on the best data available. Rep., vol. II, at 250. It has relied upon some of the best experts available (*Id.*, at 232), yet because of Colorado's lack of data collection during the study period, Kansas has been blocked by the

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[13] These values would be reduced to usable amounts by the appropriate usable flow method.

[14] Cf. Rep., vol. II, at 321-22.

Master on the basis that there is too much uncertainty in its evidence.

This Court recommended in *Colorado v. Kansas* and other equitable apportionment cases that the states solve their differences by compact. It is not consistent with that policy to allow one state to take unilateral action to the detriment of the other compacting state. To allow Colorado to fail to collect data, to "hide in the noise" of the existing and inadequate data (*see* Rep., App., Ex. 9, at App. 103), to initiate and to benefit from, a post-Compact development, and then to deny Kansas protection under the Compact because modeling results are made uncertain by the same lack of data, emasculates Article IV-D of the Compact. Such a ruling encourages states to initiate post-Compact developments without definitively testing compact compliance and discourages the collection of data that would help determine compact compliance.

The placement of the burden of proof is a matter of public policy and substantive law. *American Dredging Co. v. Miller*, 114 S. Ct. 981, 988 (1994). The public policy in this case should not reward the state that proceeds without adequate prior studies, that benefits from the project and that controls the data necessary for the determination of compact compliance by placing the whole burden on the downstream state. Rather, even if the ultimate burden of persuasion is on the plaintiff state, it would be fundamentally unfair also to place on the plaintiff state the burden of production of data from the defendant state.

Colorado also independently analyzed the WWSP claim with its hydrologic model, and it also found depletions. Rep., vol. II, at 318. Although it analyzed the wrong period, namely the period during which the WWSP was not operating, it found during that period that the WWSP would have caused depletions in excess of 9,000 acre-feet. *Id.*[15] And this is in spite of the fact that it made important assumptions in its own favor.[16] Thus, both Kansas

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[15] The 9,000 acre-foot figure represents simple depletions at the state line as opposed to usable depletions. *Id.*

[16] Colorado assumed (1) no effect from the WWSP between Pueblo

and Colorado have determined that the Winter Water Storage Program creates depletions not only when analyzed for the period in which it actually operated but also hypothetically in the other years of the study period in which it did not operate. Common sense and all available evidence indicate that the WWSP causes depletions.

In *Commercial Molasses Corp. v. New York Tank Barge Corp.*, 314 U.S. 104, 111 (1941), this Court noted that the burden of proof, which is synonymous with the burden of persuasion, is usually placed on the party with the better opportunity to know the fact in issue. While *Commercial Molasses* involved a bailment, the principle is not confined to that area of law. *See* 9 John H. Wigmore, *Evidence* §§ 2487-89 (Chadbourn rev. 1981). Here the Master's rejection of Kansas' WWSP claim places on Kansas not only the burden of persuasion but also the burden of coming forward with evidence.[17] The Master's approach ignored the fact that the data were accessible to Colorado, but not to Kansas. In comparable circumstances, the law has placed the burden of coming forward with evidence on the party with access to data. *See e.g., Ybarra v. Spangard*, 25 Cal.2d 486, 154 P.2d 687, 689 (1944). As this Court has noted: "The ordinary rule, based on considerations of fairness, does not place the burden upon a litigant of establishing facts peculiarly within the knowledge of his adversary." *United States v. New York, N.H. & H. R.R.*, 355 U.S. 253, 256 n.5 (1957). The concepts of fairness noted in these cases

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and Las Animas, a stretch of more than 100 river miles in the heart of the WWSP area, *id.*, at 317, n. 136, vol. I, Map in pocket; (2) accretions can be offset by Colorado against depletions no matter when they occur during the 27-year period, *see* Def. Ex. 134*, at 8.1 (R. vol. 83, at 71, vol. 86, at 160, vol. 115, at 97), Pl. App., Item 6; and (3) high winter evaporation, which tends to minimize the difference between winter and summer evaporation, and thus the calculated effect of the WWSP. *See* Rep., vol. II, at 317 n. 136.

[17] For the most recent discussion of the difference between these burdens, see *Office of Workers' Compensation Programs v. Greenwich Collieries*, 114 S.Ct. 2251, 2255-56 (1994).

compel the conclusion that, when all available data indicate depletions, the state that has control over data and that initiates a program should be the state that bears the burden of producing evidence to reduce uncertainty. The Master not only required Kansas to present a prima facie case but also relieved Colorado of the burden of coming forward with evidence to reduce assumed uncertainty in the Kansas evidence of depletions. He placed the burden of reducing uncertainty on Kansas, the party least able to carry that burden. This Court should reject that approach.

Here, the uncertainty perceived by the Master is the only bar to Kansas' satisfying its burden, other than the possibility of offsetting by accretions, discussed below. The Kansas model calculated depletions of 53,000 acre-feet, which the Kansas experts testified was their best estimate given the data limitations. Rep., vol. II, at 250; Pl. Ex. 111*** (R. vol. 89, at 9, 85, vol. 99, at 5), Rep. App., Ex. 11; R. vol. 127, at 118-19, Pl. App., Item 28. Even the attempts by the Colorado expert to alter the Kansas model to eliminate calculated depletions did not succeed. *See* Def. Ex. 1011, Comparison 4 (R. vol 133, at 61, vol. 139 at 44, 83), Pl. App., Item 7; Def. Ex. 1012, Comparison 4 (R. vol. 138, at 65, vol. 139, at 44, 83), Pl. App., Item 8.[18]

When the evidence presented by the two states is fully considered, together with the results of the work by the Colorado expert to alter the Kansas model more to his liking, it is striking that WWSP depletions just will not go away. Neither will the uncertainty in the exact quantification go away. Kansas is entitled to protection under the Compact. Any uncertainty it could do nothing about and which resulted from the unilateral action of Colorado only increases the need for protection.

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[18] The Colorado expert did not propose his results as independently reliable quantifications of depletions caused by the WWSP, but only as preferable in his opinion if the Kansas model were accepted. Rep., vol. II, at 288-89.

C. The Master Relied on a Basis as to Which the Record Was Admittedly Incomplete.

The Master based his decision to reject Kansas' Winter Water Storage Program claim on the proposition that if accretions were taken into account, then depletions would be essentially eliminated.[19] Rep., vol. II, at 335. The Master should not have relied on evidence of accretions to defeat Kansas' WWSP claim. Earlier in his Report, he examined the question of accretions and determined that the "issue needs to be examined." Rep., vol. II, at 263. He went on to say, "[I]f my conclusion on liability is confirmed by the Supreme Court, then, to refine the total amount of depletions, additional evidence will be required during the remedies phase of the trial." *Id.* Nevertheless, when the Master arrived at the question of whether the evidence showed that Colorado violated the Compact by operation of the WWSP, without waiting for the evidence that he had indicated was necessary, he rejected the Kansas claim in part on the basis of accretions. *See* Rep., vol. II, at 335. This is inconsistent with simple fairness; it is inconsistent with the precedents of this Court and it is inconsistent with the need the Master expressed for further evidence on accretions. At the very least,[20] the conclusion as to whether Kansas established its WWSP claim should have awaited a determination of the status of accretions. The Master himself stated:

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[19] "Accretions" are calculated increases in monthly stateline flows from the amount of water that would have flowed across the stateline absent the institutional change in Colorado.

[20] Kansas contends that offsetting monthly accretions against monthly depletions is contrary to the Article IV-D proviso that the waters of the river "not be materially depleted in usable quantity or availability for use . . . ." There is no evidence that would support the Master's suggestion that accretions can be used to offset the depletions forbidden by Article IV-D. Unlike the Rio Grande Compact of ten years earlier, Act of May 31, 1939, ch. 155, 53 Stat. 785, the Arkansas River Compact contains no provision for debits and credits. Cf. *id.*, at Art. VI. The Master reserved his ruling on this issue. Rep., vol. II, at 263.

> Kansas properly seeks protection against an averaging process that would allow depletions to be offset by later accretions that might not be usable because of amount or timing, or might simply come too late to compensate for earlier injury. Article IV-D of the compact addresses not only quantity but also protects the "availability for use" of Stateline flows. Rep., vol. II, at 262.

It is inconsistent with his stated position on the propriety of protecting Kansas from having accretions offset against depletions in other months, as stated above, to rely on the calculation of accretions to defeat the Kansas WWSP claim. The Master stated that "depletions are essentially eliminated if accretions are taken into account." Rep., vol. II, at 335. It is erroneous to rely on accretions when the Master has stated that additional evidence is necessary in order to determine when accretions may be offset against depletions, if at all, and when they may not.

The Master's reliance on accretions to defeat the Kansas WWSP claim is inconsistent with this Court's holding in *United States v. Texas*, 339 U.S. 707 (1950). In that case, there was no dissent from the following statement in the majority opinion: "The Court in original actions, passing as it does on controversies between sovereigns which involve issues of high public importance, has always been liberal in allowing full development of the facts." 339 U.S. at 715. Here we have a situation in which the Master has declared in no uncertain terms that more evidence is needed on remand with regard to the status of accretions. In the same Report, however, he seeks to support his final conclusion with respect to the Kansas WWSP claim by relying on the very same accretions. Such reliance would not be appropriate in the normal case, and it is even less appropriate in a case between sovereigns where this Court has specifically indicated the need for full development of the facts before making a decision.

III. Kansas' Method for Determining the Usability of Depletions is the Only Proposed Method Consistent With the Compact.

A. Introduction.

Article IV-D of the Compact prohibits material depletions "in usable quantity or availability for use." Thus, depletions from post-Compact developments calculated by the experts of the parties must be analyzed to determine how much of the depletions are usable. The foregoing language of Article IV-D, understood with the help of the prior decision of this Court, requires a daily analysis of usability if at all possible. Yet the Master chose the opposite — a usability analysis which depends on long-term averages and pays no heed to the availability-for-use criterion. Moreover, because of the hydrologic conditions present during one part (1975-82) of the study period (1950-85), the method chosen by the Master underestimates usable depletions to Kansas water users by 124,000 acre-feet. *See* Rep., vol. II, at 303; Pl. Ex. 698[21] (R. vol. 127, at 127, 146), Pl. App., Item 5.

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[21] Plaintiff's Exhibit 698 is Item 5 in the Appendix. This bar graph is a comparison of the two methods for determining usability under discussion. In red is shown the method proposed by Kansas (SWE method). In purple is shown the method adopted by the Master (HCI method with Larson coefficients). This graph shows *cumulative* usable stateline depletions. Thus, the amount shown for each year is not the amount of usable depletions in that year by each method. Rather, the amount shown for each year is the accumulated usable depletions from the beginning of the study period in 1950 up to that year, all added together. The graph shows that the methods are quite comparable until about 1975, when they begin to diverge, the red bars representing the method proposed by Kansas increasing at a higher rate than the purple bars representing the method adopted by the Master. However, the cumulative difference between the two methods stops changing in 1982. In other words, the difference that has been built up between 1975 and 1982 is not increased further in the later years. That difference simply remains constant, which means that the two methods are calculating comparable amounts of usable depletions in each of those later years.

Kansas proposed the most appropriate method for determining the usability of depletions caused by post-Compact developments in Colorado. This method takes into account conditions in Kansas on a daily basis throughout the study period. Rep., vol. II, at 301-02. These conditions include the river flow at the state line and downstream in Kansas to Garden City, precipitation in Kansas, and whether the ditches in Kansas are diverting essentially all of the flow available to them. *See* R. vol. 89, at 40-50, Pl. App., Item 24. A determination is then made for each day of the study period whether all of the flow at the state line is being used in Kansas either for diversion or groundwater recharge. *Id.* If essentially all of the water flowing across the state line is being used on a certain day, and there is more capacity to use additional water if it is available, then that is a day on which additional flows are assumed to be usable. *Id.* When this analysis is done for a complete month, the percentage of days on which additional flow was determined to be usable is assigned to that month. *Id.* The percentage thus determined is multiplied against the depletions calculated by the Kansas model[22] for that same month.

Colorado also proposed a usable flow method that avoided averaging for periods longer than a month. Rep., vol. II, at 296. It applied its usable flow method in conjunction with the monthly output of its model. *Id.*

Another usable flow methodology is relevant in this context. C.L. Patterson was Chief Engineer for the Colorado Water Conservation Board and one of Colorado's original Compact Com-

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Thus, this Exhibit graphically shows that the two methods are very comparable both before 1975 and after 1982, indicating that it is only the extreme drought conditions present in the years 1975 to 1982 that cause the two methods to diverge with regard to their results. Thus, the reason for the divergence is the undisputed coincidence of high depletions and high usability in those years and not other alleged defects in the method proposed by Kansas.

[22] The Kansas model as used in this Brief is the Kansas Hydrologic-Institutional Model (H-I Model) used to quantify depletions at the state line as a result of post-Compact development in Colorado.

missioners charged with drafting the Compact. Rep., vol. I, at 78, 91. With the approval of the Colorado Attorney General and State Engineer, in February 1944, Mr. Patterson developed a quantitative method for determining usability based on the December 1943 decision of this Court. Jt. Ex. 8, at 23-24 (R. vol. 4, at 141, 142), *reprinted in* Rep., vol. II, at 292. Mr. Patterson's method was sensitive to daily variations in flow as recommended by this Court. *See id.* It limits usable flows to the instantaneous capacity of the Kansas ditches (2,000 cubic feet per second). *Id.* It also has volumetric limits for each month and for each season.[23] *Id.*

The Master's method[24] is based on calculations of average diversions as a percentage of stateline flows and average recharge over long periods of time, 36 years with respect to diversions (1950-85) and 23 years with respect to groundwater recharge (1925-48). *See* Rep., vol. II, at 293-95, 305. The Master's method assumes that 82% of all summer flows and 35% of all winter flows are usable either as surface diversions or as groundwater recharge. *See id.* These percentages are the same year after year from 1950 through 1985. Thus, a portion of the depletions (18% in the summer and 65% in the winter) is *always* considered to be unusable in Kansas regardless of actual conditions.

B. The Master's Averaging Method is Inconsistent with Article IV-D.

The proviso of Article IV-D of the Compact states as follows:

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[23] The percentage of flows determined to be usable each month under both Kansas' method and the Patterson method is given in Pl. Ex. 646 (R. vol. 89, at 62, 85, vol. 99, at 106), Pl. App., Item 4.

[24] In the Report the method proposed by Kansas for approval ultimately by the Court is referred to as the "Spronk Approach" (or "SWE Method"). The method adopted by the Master is referred to in the Report as the "Durbin Approach" (or "HCI method") with "the Larson Modifications." The method proposed by Colorado is referred to as the "Helton Approach." *See* Rep., vol. II, at 293-305.

> Provided, that the waters of the Arkansas River, as defined in Article III, *shall not be materially depleted in usable quantity or availability for use* to the water users in Colorado and Kansas under this Compact . . . . (Emphasis added.)

The plain meaning of the words emphasized above excludes the notion of averaging over multi-year periods and requires consideration of hydrologic variability as it affects supply and demand. The words "in usable quantity or availability" also echo the words of this Court in the 1943 decision in *Colorado v. Kansas*, 320 U.S. 383 at 396-97 as quoted in the Master's Report:

> "The Kansas ditches are capable of diverting water only up to 2,000 c.f.s. When the flow is greater the excess cannot be diverted and used. It is admitted that the character of the flow of the river in Colorado is variable from year to year, from season to season, and from day to day, and the main river below Canon City may be almost without water one day, run a flood the next day, and, on the following day, be in practically its original condition. Thus it appears that both in Colorado and in Kansas there may at one time be flood water unavailable for direct diversion and, at another, not enough water to supply the capacity of diversion ditches. *The critical matter is the amount of divertible flow at times when water is most needed for irrigation. Calculations of average annual flow, which include flood flows, are, therefore, not helpful in ascertaining the dependable supply of water usable for irrigation*". (Emphasis added.) Rep., vol. II, at 291-92 (emphasis in the Report).

Nor was the need to avoid averages to the maximum extent possible lost on the negotiators of the Compact, many of whom were

involved in the Supreme Court case. As a result, Article II of the Compact specifically provides:

> The provisions of this Compact are based on . . . (2) the opinion of the United States Supreme Court entered December 6, 1943, in the case of *Colorado v. Kansas* (320 U.S. 383) concerning the relative rights of the respective States in and to the use of waters of the Arkansas River. . . .

The drafters of the Compact then proceeded to require that the waters of the Arkansas River not be "materially depleted in *usable quantity or availability*," emphasizing the need to observe the usability and availability of waters to the maximum extent possible in line with the insights of the 1943 Supreme Court opinion.

Thus, this Court and the compacting states have recognized the need to assess the usability of flows on a daily basis to the maximum extent possible. Long-term averages were considered "unhelpful" by this Court in 1943 and are inconsistent with Article IV-D of the Compact. And as the Master himself recognized, in parts of the Report other than that quoted above, usable flow averages are not acceptable under the Compact. *See* Rep., vol. I, at 52, vol. II, at 262.

While the Master obviously recognized the shortcomings involved in relying on averages in general, and the mandate from this Court and the Compact itself to avoid such reliance, he chose a method of analyzing usability that relies not just on averages, but long-term averages. The quotation from the opinion of the Court in *Colorado v. Kansas* makes clear that usability varies on a daily basis in the Arkansas River Valley. To accept the Master's approach is tantamount to reading the language "in usable quantity or availability" out of the Compact. Nevertheless, the Master recommended that the Kansas daily analysis of usability be rejected in favor of a method that assesses usability based on averages spanning decades.

The Master's method does not recognize daily variations in usability. *See* Rep., vol. II, at 293-95, 305. It does not even recognize monthly variations or even variations over a full season. *Id.* In fact, it assumes that every irrigation season is like every other irrigation season in the whole 36-year study period. *Id.* It also assumes that every winter season is exactly the same as every other winter season, allowing no variability from year to year, let alone day to day. *Id.* Kansas' method is the only method proposed to the Master which accounts for the kind of variability that was contemplated by the Supreme Court, by the Patterson method and by Article IV-D of the Compact. Further, compared to the Patterson method, Kansas' method is generally lower in its quantification of usability. In fact, the Patterson method yields higher usable flows than Kansas' method in most months. *See* Pl. Ex. 646 (R. vol. 89, at 62, 85, vol. 99, at 106), Pl. App., Item 4.

The Master suggested that Kansas' method produces the greatest amount of depletions of usable flow, by comparing it to the results of the method he ultimately adopted. *See* Rep., vol. II, at 302-03. But Kansas' method always yields lower usable flows than the Patterson method, which was proposed by Colorado shortly after the Supreme Court decision in *Colorado v. Kansas*, 320 U.S. 383 (1943).

C. Kansas' Daily Method is Consistent With Article IV-D.

Both Colorado and Kansas agree that depletions were generally highest during the late 1970s and early 1980s than at any other time during the 1950-85 study period. *See* R. vol. 127, at 120-21, 124, Pl. App., Item 28. The period of drought which occasioned the high pumping and therefore the high depletions of stateline flows also had the effect of increasing the usability of flows in Kansas dramatically. *Id.*, at 123-24. The chief Colorado expert agreed that the usability in Kansas was very high during the 1970s. *See* R. vol. 115 at 33, Pl. App., Item 26. The Kansas evidence for this period shows almost 100% usability. *See* Pl. Ex. 646 (R. vol. 89, at 62, 85, vol. 99, at 106), Pl. App., Item 4. This

was the only evidence specifically addressing this period (1975-82). The Master's choice of an averaging method led him to exclude some 124,000 acre-feet of depletions to usable flow based on the numbers presented by Kansas. *See* Rep., vol. II, at 303. The telling point here is that the averaging method and Kansas' method matched quite closely over more normal hydrologic periods. *Id.* Pl. Ex. 698 (R. vol. 127, at 127, 146), Pl. App., Item 5. The only part of the 1950-85 study period in which the Master's method and Kansas' method differ significantly is the 1975-82 drought period, which is the only part of the study period where high depletions and high usability coincided.

D. The Master Incorrectly Rejected Kansas' Method Based on Unsubstantiated Criticisms.

In the initial part of the trial before the Master, Colorado criticized the usable flow method adopted by the Master because it depended on long-term averages. *See* R. vol. 53 at 143-46, 148-49, Pl. App., Item 21. Colorado's own method varied from month to month. *See* Rep., vol. II, at 296. But Colorado has now developed arguments in an effort to support the long-term averaging method it earlier debunked.

Despite the characteristics of Kansas' method, which make it the only method consistent with Article IV-D, namely its recognition of daily changes in usability, the Master has rejected Kansas' method based on several arguments by Colorado. *See* Rep., vol. II, at 302-05. The first argument raised by Colorado that the Master accepted is that the Kansas model, which calculates the basic depletions at the state line, is itself based on "average data." *Id.* at 302. First, the argument itself is incorrect.[25] Second, Kansas is limited to the data collected in Colorado, the same data which were relied upon by Colorado when the institutional changes

[25] Although certain components of the Kansas model are based on averages, many important components, such as mainstem stream flows, are available and used in the model on a daily basis. R. vol. 54, at 122-23, 125, Pl. App., Item 22.

complained of by Kansas were initiated in Colorado. If the data are sufficient for Colorado to determine that those institutional changes can be undertaken without violating the Compact, that data should also be sufficient for analyzing compliance with the Compact after the fact. In other words, Colorado, not Kansas, should bear the risk of the lack of adequate (non-average) data, as explained more fully *supra* at 28-32. Moreover, the Colorado model is based just as much on average data as the Kansas model is, and Colorado had no hesitation applying its own usable flow method that varied on a monthly basis to the results of its model. Rep., vol. II, at 296. In addition, Colorado makes no claim that its model is more accurate than the Kansas model.

The Master impliedly criticized Kansas for proposing a method that gives a greater amount of depletion of usable flow than the method he chose. *See* Rep., vol. II, at 302-03. However, this is not generally true. The Master's statement is overbroad because it is only during the late 1970s and early 1980s, when high depletions coincided with high usability, that Kansas' method gives higher quantifications of depletions of usable flow than the method he chose. *See* Pl. Ex. 698 (R. vol. 127, at 127, 146), Pl. App., Item 5. In other periods, Kansas' method produces results that are very similar to those of the Master's averaging method. *Id.*

On the basis of arguments made by Colorado, the Master indicated that he believed that the Kansas usable flow method required the Kansas model to be "accurate" on a monthly basis. *See* Rep., vol. II, at 303. Although the Master adopted this factual assertion, Colorado never demonstrated any factual basis for it. The Master stated no factual basis (*see id.*), nor is Kansas aware of any. How uncertainty with regard to the calculated depletions at the state line makes more appropriate a method based on long-term averages is not explained. Several things are clear, however: (1) Any additional water that had come across the state line in the drought of the late 1970s would have been usable in Kansas for either diversion or groundwater recharge, R. vol. 127, at 123-24, 132-33, Pl. App., Item 28; (2) the Master's method does not

recognize that fact, *id.*; and (3) as a result, the Master underestimated the usable depletions for the period 1975-82, *id.*

The question of which usable flow analysis to use is not a question of the accuracy of the Kansas model. Rather, it is a question of the accuracy of the respective usable flow methods, that is, whether it is appropriate to select a usable flow method that ignores the undisputed coincidence of high depletions and high usability in the late 1970s and early 1980s just because the model calculations have uncertainty associated with them. *Id.* Unfounded requirements of accuracy for the Kansas model should not be allowed to defeat a usable flow method which is otherwise the method most compatible with Article IV-D's requirement that the waters of the Arkansas River not be depleted in "usable quantity or availability."

The final objection that the Master suggested in opposition to Kansas' method is that "Colorado's experts also criticized the Spronk usable flow analysis because it did not factor out increased losses in the Arkansas River in Kansas due to increased well development in Kansas in the 1970s. To the extent that well development in Kansas may have increased the amount of streamflow going to groundwater recharge, the point is valid." Rep., vol. II, at 304 (citations omitted). Colorado never established that this concern actually caused the method to give unreasonable results. It is simply a possibility. In fact, Colorado's counterclaim based on the same allegation of increased pumping, was dismissed by the Master for the reason that Colorado had not proved its case. Order Granting Kansas' Motion to Dismiss Colorado's Well Counterclaim. Rep., vol. III, at 447. However, the Master accepted a known shortcoming with the averaging method, namely, the undisputed underestimation of usable depletions in the late 1970s and early 1980s, in order to avoid the possibility of a problem with the better method which Colorado has alleged but has not been able to prove.

The sufficient answer to all criticisms proposed by Colorado and adopted by the Master regarding the usable flow method proposed by Kansas is the fact that outside the critical period of

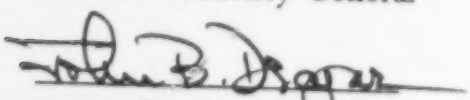
1975 through 1982 the two methods are essentially the same. Pl. Ex. 698 (R. vol. 127, at 127, 146), Pl. App., Item 5. If the Master's criticisms were valid, the differences between the methods would be more general and would be visible both before and after the critical period. On the contrary, however, the methods are almost identical before 1975 and after 1982. If there is a problem in using Kansas' method because of the alleged monthly inaccuracy of the Kansas model, that same problem would create a difference between the results of the two methods in periods of normal or more normal hydrology. Yet nothing of the sort appears. If effects of increased post-Compact pumping in Kansas were affecting the validity of Kansas' method, this would continue to be the case after the end of the critical period, namely, in the years 1983 through 1985. However, nothing of the sort appears. If the fact that the Kansas model must rely in part on average data were making the use of the Kansas usable flow method inappropriate, the alleged inappropriateness would manifest itself in divergences between the two methods both before and after the critical period. Again, nothing of the sort appears.

CONCLUSION

On the basis of the foregoing, Kansas requests the Court to (1) deny Colorado's Motion to Dismiss Kansas' Trinidad Reservoir Claim and remand the issue to the Master with instructions that the test of Compact compliance is to be compliance with the Trinidad Dam and Reservoir Project Operating Principles adopted by the Arkansas River Compact Administration; (2) accept Kansas' claim that operation of the Colorado Winter Water Storage Program has violated Article IV-D of the Arkansas River Compact, or, in the alternative, remand this issue to the Master for consideration of the effects of accretions on the claim; (3) accept the Kansas usable flow method for purposes of determining compliance with Article IV-D of the Arkansas River Compact; and (4) in all other respects to adopt the Report of the Master.

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APPENDIX

APPENDIX

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* Page numbers beginning with A-1 have been assigned to all Appendix pages except the copies of Pl. Exs. 646 and 698.

Appendix Item 1

Table 1 From Pl. Ex. 30

Decreed and Permitted Well Data Base and Summaries — (Bent County, Prowers County, Pueblo County and Crowley/Otero Counties)

Table 1
From Pl. Ex. 30

Cumulative Number and Capacity of
Irrigation Wells

1948-1985

	UPSTREAM OF JOHN MARTIN RESERVOIR		DOWNSTREAM OF JOHN MARTIN RESERVOIR	
YEAR	NUMBER	CAPACITY (CFS)	NUMBER	CAPACITY (CFS)
1948	792	866	57	128
1949	815	884	63	142
1950	864	935	77	181
1951	927	995	87	210
1952	962	1021	108	283
1953	1051	1126	137	380
1954	1162	1240	168	474
1955	1284	1386	201	564
1956	1331	1439	227	649
1957	1380	1504	248	707
1958	1388	1507	253	722
1959	1419	1528	260	741
1960	1475	1598	290	819
1961	1508	1628	310	880
1962	1522	1638	319	899
1963	1576	1697	416	1115
1964	1713	1846	527	1373
1965	1783	1930	594	1531
1966	1789	1932	609	1581
1967	1794	1939	623	1631
1968	1794	1939	642	1703
1969	1800	1950	653	1730
1970	1803	1952	661	1737
1971	1804	1953	667	1750
1972	1809	1956	678	1775
1973	1810	1957	686	1797
1974	1813	1961	693	1816
1975	1813	1961	701	1843
1976	1813	1961	721	1898

YEAR	UPSTREAM OF JOHN MARTIN RESERVOIR NUMBER	UPSTREAM OF JOHN MARTIN RESERVOIR CAPACITY (CFS)	DOWNSTREAM OF JOHN MARTIN RESERVOIR NUMBER	DOWNSTREAM OF JOHN MARTIN RESERVOIR CAPACITY (CFS)
1977	1816	1962	726	1909
1978	1816	1962	726	1909
1979	1816	1962	727	1914
1980	1816	1962	727	1914
1981	1816	1962	727	1914
1982	1816	1962	727	1914
1983	1816	1962	727	1914
1984	1816	1962	727	1914
1985	1816	1962	727	1914

LOCATION: PUEBLO, OTERO, CROWLEY, BENT AND PROWERS COUNTIES.
TOWNSHIP 20-24 SOUTH AND RANGE 41-65 WEST

SOURCE: DECREED AND PERMITTED WELL DATA BASE, SPRONK WATER ENGINEERS, INC.

FILE: WELLSUMM1.WK1

Appendix Item 2

Excerpt from Pl. Ex. 129

Report by Douglas R. Littlefield, Ph.D.,
"The History of the
Arkansas River Compact,"
August 1990

Volume II
Page 387

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. . . Third, the fundamental idea of maintaining the status quo was well understood by all concerned parties, including both states' negotiators, their constituent water users, and the Bureau of Reclamation.

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Appendix Item 3

Pl. Ex. 580

Trinidad Effects, 1979-84, Based on Bureau of Reclamation, Final Report on Review of Operating Principles, Trinidad Project, 1988

Pl. Ex. 580

TRINIDAD EFFECTS
(1000 Acre-feet)

YEAR	CASE I		CASE II	
	NET EFFECT ON JOHN MARTIN (Table 4 - Col. 3)	DEPLETION TO CONSERVATION STORAGE	NET EFFECT ON JOHN MARTIN	DEPLETION TO CONSERVATION STORAGE
1979	−3.1	−1.7	−4.0	−1.8
1980	−4.1	−11.1	−9.0	−17.5
1981	1.1	−2.8	−1.5	−2.3
1982	−1.8	−3.2	−5.4	−3.3
1983	4.3	−4.7	1.7	−2.0
1984	7.0	−1.0	6.6	−1.0
TOTAL	3.5	−24.5	−11.6	−27.5
AVERAGE	0.6	−4.1	−1.9	−4.5

Appendix Item 4

Pl. Ex. 646

Number of Days When Flow of the Arkansas River at the Stateline is All Used in Kansas (1949-1986)

NUMBER OF DAYS WHEN FLOW OF THE ARKANSAS RIVER
AT THE STATELINE IS ALL USED IN KANSAS

COMPARISON OF C. L. PATTERSON'S DEFINITION OF USABLE FLOW
AND THAT ACTUALLY USED BASED ON OBSERVED FLOWS.

USGS WATER YEAR		OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT-MAR TOTAL	APR-SEP TOTAL	ANNUAL TOTAL	% OF TIME STATELINE FLOW IS ALL USED IN KANSAS		
																	OCT-MAR	APR-SEP	ANNUAL
1949	PATTERSON	8	26	27	26	0	0	30	31	19	31	21	10	87	142	229	48%	78%	63%
	ACTUAL	10	0	0	0	0	0	0	0	0	0	0	0	10	0	10	5%	0%	3%
1950	PATTERSON	13	25	31	28	0	0	30	31	29	31	31	18	97	170	267	53%	93%	73%
	ACTUAL	0	0	0	0	0	0	7	13	13	0	0	0	0	33	33	0%	18%	9%
1951	PATTERSON	23	25	27	26	0	0	30	25	26	31	31	8	101	151	252	55%	83%	69%
	ACTUAL	0	0	0	0	0	0	0	6	0	0	0	0	0	6	6	0%	3%	2%
1952	PATTERSON	19	23	28	26	0	0	30	31	30	31	31	30	96	183	279	52%	100%	76%
	ACTUAL	1	0	0	0	0	0	0	0	26	31	25	30	1	112	113	1%	61%	31%
1953	PATTERSON	31	30	31	31	28	31	30	31	30	31	30	30	182	182	364	100%	99%	100%
	ACTUAL	31	13	0	3	10	25	30	31	30	27	18	30	82	166	248	45%	91%	68%
1954	PATTERSON	31	30	31	31	28	31	30	31	30	30	25	30	182	176	358	100%	96%	98%
	ACTUAL	31	22	2	3	0	1	22	31	30	25	21	30	59	159	218	32%	87%	60%
1955	PATTERSON	31	30	31	31	28	31	30	29	30	31	28	30	182	178	360	100%	97%	99%
	ACTUAL	24	6	3	4	2	9	11	16	1	28	23	24	48	103	151	26%	56%	41%
1956	PATTERSON	31	30	31	31	29	31	30	31	30	30	30	30	183	181	364	100%	99%	99%
	ACTUAL	30	17	0	0	1	0	27	27	29	25	27	30	48	165	213	26%	90%	58%
1957	PATTERSON	31	30	31	31	28	31	30	29	30	30	23	10	182	152	334	100%	83%	92%
	ACTUAL	31	30	15	20	14	29	6	15	0	11	18	17	139	67	206	76%	37%	56%
1958	PATTERSON	14	30	31	31	28	1	30	30	30	30	31	30	135	181	316	74%	99%	87%
	ACTUAL	11	0	0	0	0	0	0	0	0	2	6	11	11	19	30	6%	10%	8%
1959	PATTERSON	19	30	31	31	8	0	30	31	30	31	29	10	119	161	280	65%	88%	77%
	ACTUAL	18	18	0	0	0	0	0	1	8	24	18	19	36	70	106	20%	38%	29%
1960	PATTERSON	16	28	31	31	4	0	30	31	30	31	31	30	110	183	293	60%	100%	80%
	ACTUAL	0	0	0	2	1	0	0	9	6	26	31	30	3	102	105	2%	56%	29%
1961	PATTERSON	31	30	31	31	28	31	30	31	29	31	31	30	182	182	364	100%	99%	100%
	ACTUAL	31	30	2	1	1	24	30	31	11	30	30	30	89	162	251	49%	89%	69%
1962	PATTERSON	20	30	31	31	15	0	30	30	30	31	31	30	127	182	309	70%	99%	85%
	ACTUAL	26	2	0	0	0	0	7	18	4	24	28	27	28	108	136	15%	59%	37%
1963	PATTERSON	31	30	31	31	28	31	30	31	30	31	31	30	182	183	365	100%	100%	100%
	ACTUAL	31	30	31	12	1	15	30	31	23	28	31	30	120	173	293	66%	95%	80%
1964	PATTERSON	31	30	31	31	29	31	30	29	30	31	31	30	183	181	364	100%	99%	99%
	ACTUAL	28	30	27	12	8	27	30	29	11	31	31	30	132	162	294	72%	89%	80%
1965	PATTERSON	31	30	31	31	28	31	30	31	20	20	3	0	182	104	286	100%	57%	78%
	ACTUAL	31	30	31	31	28	31	30	30	16	0	0	0	182	76	258	100%	42%	71%
1966	PATTERSON	23	22	22	16	0	0	30	31	28	31	6	0	83	126	209	46%	69%	57%
	ACTUAL	0	0	0	0	0	0	0	23	14	10	1	0	0	48	48	0%	26%	13%
1967	PATTERSON	21	30	31	31	28	8	30	30	30	31	12	0	149	133	282	82%	73%	77%
	ACTUAL	0	2	0	0	0	0	11	24	0	0	0	5	2	40	42	1%	22%	12%
1968	PATTERSON	12	30	31	31	20	0	30	31	30	31	31	30	124	183	307	68%	100%	84%
	ACTUAL	17	0	0	0	0	9	20	21	3	20	21	30	26	115	141	14%	63%	39%
1969	PATTERSON	31	30	31	31	28	31	30	30	30	31	31	29	182	181	363	100%	99%	99%
	ACTUAL	31	30	17	0	0	0	0	3	8	11	19	2	78	43	121	43%	23%	33%
1970	PATTERSON	29	30	31	31	18	0	30	31	30	31	31	30	139	183	322	76%	100%	88%
	ACTUAL	0	0	0	0	9	0	0	23	19	23	27	28	9	120	129	5%	66%	35%
1971	PATTERSON	29	30	31	31	10	0	30	31	30	31	31	30	131	183	314	72%	100%	86%
	ACTUAL	15	0	0	0	0	1	30	29	16	31	31	30	16	167	183	9%	91%	50%

PLAINTIFF'S EXHIBIT
646
Orig. No. 105

NUMBER OF DAYS WHEN FLOW OF THE ARKANSAS RIVER AT THE STATELINE IS ALL USED IN KANSAS

COMPARISON OF C. L. PATTERSON'S DEFINITION OF USABLE FLOW AND THAT ACTUALLY USED BASED ON OBSERVED FLOWS.

USGS WATER YEAR		OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT-MAR TOTAL	APR-SEP TOTAL	ANNUAL TOTAL	% OF TIME STATELINE FLOW IS ALL USED IN KANSAS		
																	OCT-MAR	APR-SEP	ANNUAL
1972	PATTERSON	31	30	31	31	29	13	30	31	30	31	31	30	165	183	348	90%	100%	95%
	ACTUAL	31	30	31	29	28	31	30	31	30	31	23	7	180	152	332	98%	83%	91%
1973	PATTERSON	31	30	31	31	28	31	30	31	30	31	31	30	182	183	365	100%	100%	100%
	ACTUAL	31	4	4	3	0	0	0	0	11	31	31	30	42	103	145	23%	56%	40%
1974	PATTERSON	31	30	31	31	28	31	30	31	30	31	31	30	182	183	365	100%	100%	100%
	ACTUAL	31	30	31	14	0	0	11	28	30	31	31	30	106	161	267	58%	88%	73%
1975	PATTERSON	31	30	31	31	28	31	30	31	29	31	31	30	182	182	364	100%	99%	100%
	ACTUAL	31	30	31	31	28	18	27	26	14	19	31	30	169	147	316	93%	80%	87%
1976	PATTERSON	31	30	31	31	29	31	30	31	30	31	31	30	183	183	366	100%	100%	100%
	ACTUAL	31	30	31	31	29	31	30	31	30	31	31	30	183	183	366	100%	100%	100%
1977	PATTERSON	31	30	31	31	28	31	30	31	30	31	31	30	182	183	365	100%	100%	100%
	ACTUAL	31	30	31	31	28	31	30	31	30	31	31	30	182	183	365	100%	100%	100%
1978	PATTERSON	31	30	31	31	28	31	30	31	29	31	31	30	182	182	364	100%	99%	100%
	ACTUAL	31	30	31	31	28	31	30	31	28	31	31	30	182	181	363	100%	99%	99%
1979	PATTERSON	31	30	31	31	28	31	30	31	30	31	31	30	182	183	365	100%	100%	100%
	ACTUAL	31	30	31	31	28	31	30	31	30	31	31	30	182	183	365	100%	100%	100%
1980	PATTERSON	31	30	31	31	29	31	30	31	30	19	31	30	183	171	354	100%	93%	97%
	ACTUAL	31	30	31	31	29	31	30	31	30	31	12	30	183	164	347	100%	90%	95%
1981	PATTERSON	31	30	31	31	28	31	30	31	30	31	31	30	182	183	365	100%	100%	100%
	ACTUAL	31	30	31	17	0	23	30	31	30	31	31	30	132	183	315	73%	100%	86%
1982	PATTERSON	31	30	31	31	28	31	30	31	30	31	31	30	182	183	365	100%	100%	100%
	ACTUAL	31	30	31	31	28	31	30	31	30	31	31	30	182	183	365	100%	100%	100%
1983	PATTERSON	31	30	31	31	28	31	30	31	30	31	23	30	182	175	357	100%	96%	98%
	ACTUAL	31	30	31	1	20	31	21	31	30	31	31	30	144	174	318	79%	95%	87%
1984	PATTERSON	15	30	31	31	16	0	30	31	30	24	31	21	123	167	290	67%	91%	79%
	ACTUAL	31	30	31	19	7	25	14	22	30	28	30	30	143	154	297	78%	84%	81%
1985	PATTERSON	12	24	28	31	0	0	30	31	13	29	13	0	95	116	211	52%	63%	58%
	ACTUAL	18	0	0	0	0	3	23	6	0	29	14	7	21	79	100	12%	43%	27%
1986	PATTERSON	19	25	29															
	ACTUAL	0	0	0															
AVERAGES (W/O 1986)																			
	PATTERSON	26	29	30	30	21	18	30	31	29	30	28	24	154	171	325	85%	93%	89%
	ACTUAL	22	17	14	10	9	13	17	21	17	22	21	22	85	120	205	47%	66%	56%
MINIMUMS (W/O 1986)																			
	PATTERSON	8	22	22	16	0	0	30	25	13	19	3	0	83	104	209	46%	57%	57%
	ACTUAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0%	0%	2%
MAXIMUMS (W/O 1986)																			
	PATTERSON	31	30	31	31	29	31	30	31	30	31	31	30	183	183	366	100%	100%	100%
	ACTUAL	31	30	31	31	29	31	30	31	30	31	31	30	183	183	366	100%	100%	100%

PERCENTAGE OF TIME ALL STATELINE FLOW IS USED IN KANSAS (W/O 1986)													NOV-MAR AVERAGE	APR-OCT AVERAGE
PATTERSON	83%	97%	98%	97%	74%	59%	100%	99%	96%	97%	89%	80%	85%	92%
ACTUAL	71%	56%	44%	34%	31%	43%	56%	67%	56%	72%	69%	73%	42%	66%

USABLE FLOW PERCENTAGES (PER HCI)														
HCI	82%	35%	35%	35%	35%	35%	82%	82%	82%	82%	82%	82%	35%	82%

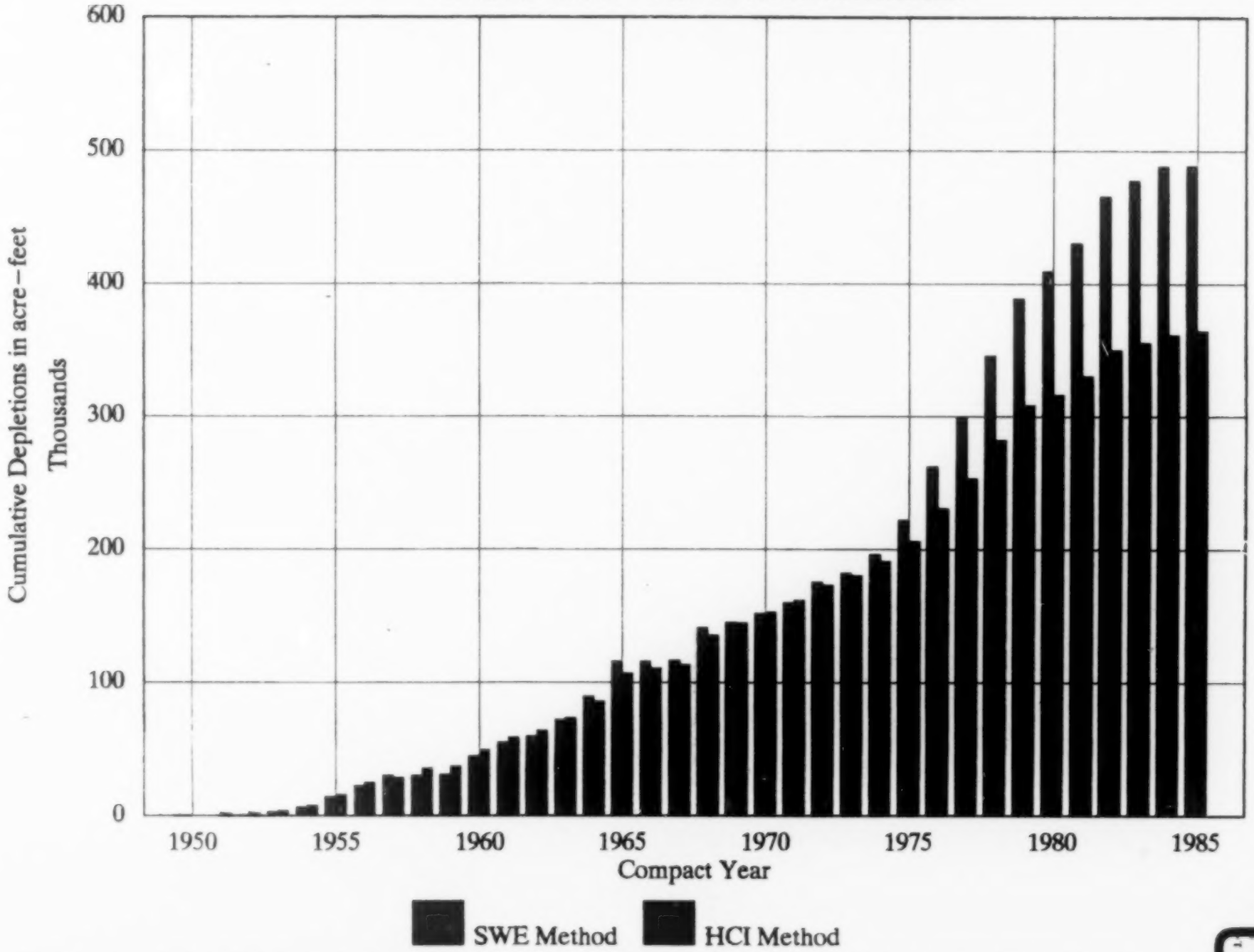
Appendix Item 5

Pl. Ex. 698

Usable Stateline Depletions, Combined Effects - SWE Method and HCI Method (Cumulative), 1950-1985

Usable Stateline Depletions

Combined Effects – SWE Method & HCI Method



Note: For compact year 1950, depletions were assumed to be zero for months of November and December.
Values shown are derived from Pl. Exhibits 560** and 647.

PLAINTIFF'S EXHIBIT
698
Case No. 105

Appendix Item 6

Excerpt from Def. Ex. 134*

Boyle Engineering Corporation and Tipton & Kalmbach, Inc., Arkansas River Basin Study, Results of Winter Water Storage Program Simulation (December 1990)

Columns (1) and (16) from Page 8.1, Def. Ex. 134*
POTENTIAL IMPACT OF WINTER WATER
STORAGE SIMULATION
** PASS #2 ** (ACRE-FEET)

*****

COMP YEAR (1)	— CHANGE IN STATE LINE FLOW —	ANNUAL (16)	
1950		230	
1951		221	
1952		148	
1953		−137	
1954	*****	106	*****
1955		63	
1956		−101	
1957		−233	
1958		−281	
1959		−162	
1960		−217	
1961		10	
1962		105	
1963		−57	
1964		−103	
1965		−350	
1966		−393	
1967		−540	
1968		−919	
1969		−1178	
1970		−895	
1971		−1259	
1972		−1116	
1973		−731	
1974		−447	
1975		−636	
1978		−693	
1950−75 & 78 AVG		−354	

Notes:

(a) A positive value indicates an increase in river gain, diversion or storage as a net result of the simulation of the winter water storage program.

*****

Appendix Item 7

Excerpt from Def. Ex. 1011

Changes in Stateline Flow ADMIN.FOR (Dec. 1991 version and Feb. 24, 1992 version of RIGHT.DAT) and Modified HI Model (Sep. 1992)

CHANGES IN STATELINE FLOW

ADMIN.FOR (Dec. 1991 version and Feb. 24, 1992 version of RIGHT.DAT)
and Modified HI Model (Sep. 1992)

INSTITUTIONAL CONDITIONS						TOTAL		SWE'S USABLE		HCI's USABLE (Helton's coeff.)	
COMP	OUR RUN	PUMP	WW	1980	TM	DEPLETIONS	DEPLETIONS& ACCRETIONS	DEPLETIONS	DEPLETIONS& ACCRETIONS	DEPLETIONS	DEPLETIONS& ACCRETIONS
							.....				
4	D3	H	H	C	H	25,892	22,233	16,484	12,897	10,981	8,342
	D4	H	C	C	H	MODIFIED HI MODEL					
							.....				

Appendix Item 8

Excerpt From Def. Ex. 1012

Changes in Stateline Flow, ADMIN.FOR (Dec. 1991 version and Feb. 24, 1992 version of RIGHT.DAT) and Winter Consumptive Use Modification to HI Model (Sep. 1992)

CHANGES IN STATELINE FLOW
ADMIN.FOR (Dec. 1991 version and Feb. 24, 1992 version of RIGHT.DAT)
and Winter Consumptive Use Modification to HI Model (Sep. 1992)

		INSTITUTIONAL CONDITIONS				TOTAL		SWE'S USABLE		HCI's USABLE (Helton's coeff.)	
COMP	OUR RUN	PUMP	WW	1980	TM	DEPLETIONS	DEPLETIONS& ACCRETIONS	DEPLETIONS	DEPLETIONS& ACCRETIONS	DEPLETIONS	DEPLETIONS& ACCRETIONS
						.....					
4	N26	H	H	C	H	25,532	−29,462	16,454	199	7,012	−31,986
	N27	H	C	C	H	MODIFIED HI MODEL TO ALLOW WINTER PET TO VARY WITH IRR. APPLICATION RATE					

Appendix Item 9

Excerpt from Jt. Ex. 3

The Record of Meetings of the Colorado-Kansas Arkansas River Compact Commission

Mr. Dixon [Director of Branch of Project Planning, U.S. Bureau of Reclamation]

•••••

My understanding in reading this, and the purpose of my question was—this says, "shall not be depleted in usable quantity or availability for use to the water users"—

Mr. Vidal [Commissioner for Colorado]

MR. VIDAL: Under this Compact.

MR. DIXON: Under this Compact, yes.

MR. VIDAL: We are trying to preserve a status quo.

MR. DIXON: I understand that. Of course, we are sympathetic to that objective.

•••••

Appendix Item 10

Excerpt from Jt. Ex. 4

Transcripts of Meetings of the Colorado-Kansas Arkansas River Compact Commission From the Files of General Kramer in the National Archives

[Pages 54-55]

*****

MR. VIDAL: ***** We are compacting about the present existing situation.

MR. KNAPP: That is right, we are compacting on the present condition. I am sure the Kansas Commissioners will want to be assured that the present conditions on the river will not be disturbed by the possibility of consumptive uses upstream.

*****

Appendix Item 11

Excerpt from Jt. Ex. 18-32

Annual Reports of the Arkansas River Compact Administration From 1949 Through December, 1984

[Pages 47-48]

APPENDIX "C-3"

Resolution

CONCERNING AN INVESTIGATION OF TRINIDAD RESERVOIR OPERATIONS

WHEREAS, it has come to the attention of the Arkansas River Compact Administration that 18,290 acre-feet of water stored under the Model Reservoir water right in Trinidad Reservoir during compact year 1979 was transferred to the joint use pool on September 28, 1979 by action of the Board of Directors of the Purgatoire River Water Conservancy District without objection from the Divis[i]on Engineer for Division 2, Colorado Division of Water Resources; and

WHEREAS, an additional 20,000 acre-feet was stored in Trinidad Reservoir under the Model Reservoir right during compact year 1980; and

WHEREAS, the State of Kansas has questioned whether these actions are in conformity with the operating principles for Trinidad Reservoir;

NOW, THEREFORE, BE IT RESOLVED that pursuant to Article VIII, paragraph H of the Arkansas River Compact, the Compact Administration shall cause an investigation to be made of these circumstances; and

BE IT FURTHER RESOLVED that this investigation shall be accomplished on behalf of the Compact Administration by the Colorado Water Conservation Board and the Kansas Division of Water Resources, which entities shall conduct said investigation as promptly as possible and report their determinations to the Compact Administration as soon as possible after the adoption of this resolution.

Entered this 30th day of June, 1980, at a special meeting of the Compact Administration held in Lamar, Colorado.

/s/ Frank G. Cooley, Chairman
Arkansas River Compact
Administration

/s/ Leo Idler, Secretary
Arkansas River Compact
Administration

APPENDIX "C-4"

Resolution

CONCERNING
TRINIDAD RESERVOIR

WHEREAS, the Arkansas River Compact Administration has made findings of fact relative to Trinidad Reservoir in Colorado, which findings were made at the special meeting of the Administration held in Lamar, Colorado, on September 25, 1980 (copy attached);

NOW THEREFORE, BE IT RESOLVED that the Administration goes on record as recognizing that the findings of fact made by the Administration have raised a question as to whether the waters of the Arkansas River have been materially depleted in usable quantity or availability for use to the water users in Colorado and Kansas; and

BE IT FURTHER RESOLVED that the Administration recommends that the Kansas State Engineer confer with the Colorado State Engineer to make further inquiries into this question as expeditiously as possible.

Entered this 25th day of September, 1980, at a special meeting of the Administration held in Lamar, Colorado.

/s/ Frank G. Cooley, Chairman
Arkans[s]as River Compact
Administration

/s/ Leo Idler, Secretary
Arkansas River Compact
Administration

Appendix Item 12

Excerpt from Jt. Ex. 19

Minutes of Meetings of the Arkansas River Compact Administration from 1949 Through December, 1984

MINUTES OF
ARKANSAS RIVER COMPACT ADMINISTRATION
SPECIAL MEETING

Court House
Lamar, Colorado
June 6, 1967

Attendance:

For Colorado:

Felix L. Sparks, Denver
Ernest Hofmeister, Lamar
George F. Reyher, McClave

For Kansas:

Robert V. Smrha, Topeka
Carl E. Bentrup, Deerfield
Logan N. Green, Garden City

For the United States:

Wilbur L. Heckler, Albuquerque, New Mexico

Others Attending:

G. D. Steward	Otero Co.	Rocky Ford, Colo.
Wayne Campbell	La Junta Chamber of Com.	La Junta, Colo.
Earl Beegles	Otero Co. Comm.	La Junta, Colo.
Everette Marshall	Catlin Ditch Board	La Junta, Colo.

Glenn G. Saunders	Purgatoire W.C. Dist.	Denver, Colo.
E. A. Thaxton	SECRA Chairman	Las Animas, Colo.
G. E. Kimble	Holbrook Lake Sptmns. Club	Swink, Colo.
Harry J. Figge	Colo. Game, Fish & Parks	Denver, Colo.
Robert A. Buchhagen	Corps of Engineers	John Martin Res.
Ross W. Moor	U.S.G.S.	Lamar, Colo.
Howard C. Corrigan	Div. of Water Res.	Garden City, Kans.
Leo J. Olson	C.F.I. Corp.	Pueblo, Colo.
Geo. T. O'Malley, Jr.	Colo. Game, Fish & Parks	Denver, Colo.
Bernie Bovee	Colo. Game, Fish & Parks	Colo. Spgs., Colo.
LeRoy Nickelson	Fort Bent	Lamar, Colo.
C. L. Nickelson	Fort Bent	Lamar, Colo.
Wm. Howland	Amity Mutual Canal	Holly, Colo.
Sisto Guidotti	Amity Mutual Canal	Bristol, Colo.
Carter Hutchinson	C.W.C.B.	Denver, Colo.
Harry C. Nevius	Amity Mutual Canal	Lamar, Colo.
W. T. Setchfield	Bent Co. Rec. Board	Las Animas, Colo.
James Donnelly	Chmn, Purgatoire W.C. Dist.	Trinidad, Colo.
Charles J. Cappellinni	Purgatoire W.C. Dist.	Trinidad, Colo.
Max Torres	Purgatoire W.C. Dist.	Trinidad, Colo.

J. L. Ogilvie	Bureau of Reclamation	Pueblo, Colo.
Ralph L. Strother	Corps of Engineers	Albuq., New Mexico
Leo J. Gamble	Bureau of Reclamation	Pueblo, Colo.
Edw. J. Tripp	U.S.G.S.	Denver, Colo.
Claire Behan	KLMR Radio	Lamar, Colo.
Donn Bynum	Tri-State Daily News	Lamar, Colo.
Clyde Albertson	Bent Co. Commissioners	Las Animas, Colo.
Frank Richards	Chamber of Commerce	Las Animas, Colo.
Dutch Schneider	Bowling Alley Owner	Las Animas, Colo.
Jack Robinson	City Council	Las Animas, Colo.
Fred L. Boydston	C.W.C.B.	Denver, Colo.
Francis M. Bell	C.W.C.B.	Denver, Colo.

MEETING CALLED TO ORDER

Chairman Heckler called the meeting to order at 9:55 A.M. He said that his first official duty was to present his credentials to the Administration. He next called for consideration of the minutes of the December 14, 1966 meeting. There being no corrections, the minutes were approved as submitted. The Chairman then read his report as follows:

REPORT

1. Appointment Credential—My appointment as federal representative to the Arkansas River Compact Administration was made by President Lyndon B. Johnson by letter of January 25, 1967. Copies of the appointment letter have been furnished to the commissioners of both States.

*****

OLD AND NEW BUSINESS

Mr. Heckler then asked if there was any unfinished business. There being none, he passed on to new business and suggested consideration of the Trinidad Project as the first item.

Mr. Sparks was asked to present the Trinidad Project for consideration. He said the project had been before the Administration for a long time and he asked if Kansas had any further questions on the project.

Mr. Smrha said that the revised operating principles had not been submitted to the Administration as such.

Mr. Sparks then submitted the revised operating principles along with a letter written to the ditch companies in Kansas. He said this material had been previously submitted to the State of Kansas. After some discussion Mr. Sparks said that these were the same principles that were submitted originally to the Administration and in addition contained the five points requested by the State of Kansas.

Mr. Bentrup said there seemed to be some conflict in Article VI whether there should be a ten-year review or a five-year review and Mr. Ogilvie was called upon to explain it.

Mr. Ogilvie said the amendments specify a five-year review shall be made instead of a ten.

After some discussion Mr. Saunders said that the amendments to the document supersede the original document.

Mr. Sparks said that in all documents such as this, the amendments supersede the original document.

Mr. Smrha then asked Mr. Ogilvie if the operating principles as amended had been sent to the ditch companies and if there had been any response to these.

Mr. Ogilvie said there had been no response from the ditch companies.

Mr. Sparks then asked if Kansas wanted anything further done with respect to the operating principles.

Mr. Smrha replied that if the question of approval was submitted to the Administration then Kansas will act.

Mr. Sparks then moved and Mr. Hofmeister seconded a motion that the Administration approve the operating principles with the understanding that the amendments take precedent over the original operating principles as presented.

Mr. Green said that he thought that it would be less clumsy to redraw the principles and incorporate the amendments into a single document. He said that as of now there were two documents to approve. He suggested that if everything were incorporated into one document then everyone would know what it means.

Mr. Sparks then asked Mr. Ogilvie to explain the operating principles and amendments.

Mr. Ogilvie said the amendments do take precedent over the original item and that the items included make one document. Mr. Ogilvie further said that at the first review the operating principles would be revised and amended as deemed necessary.

Mr. Smrha then asked for a recess of five minutes to which Mr. Heckler agreed.

Mr. Heckler reconvened the recessed meeting and Mr. Green said that the Kansas delegates had caucused and thought that if the letter of March 20, 1967, from H. P. Dugan to the Governor of Kansas and countersigned by the Purgatoire Conservancy District was referred to in an amended motion then Kansas could act upon that.

Mr. Sparks said that he would like to withdraw his original motion and make a new motion, which he did as follows:

Moved that the document of March 20, 1967 submitted to Governor Docking and signed by H. P. Dugan and countersigned by Dr. Donnelly be approved by the Arkansas River Compact Administration. Mr. Green seconded the motion and after some discussion the motion was carried by vote of the states. The documents are attached as Appendix A.

• • • • •

APPENDIX A

7-100

Hon. Robert Docking
Governor of Kansas
Topeka, Kansas

Dear Governor Docking:

On February 1, 1967, I concurred with views of the Kansas Water Resources Board and the State of Kansas relative to the Trinidad Project and the plan of operation as set forth in the "Operating Principles". At the same time, evidence of acceptance by the Purgatoire River Water Conservancy District of the five conditions set forth in Governor Avery's letter of December 30, 1966 was presented. Subsequent discussion with representatives of the Kansas Water Resources Board indicates the desirability of setting forth the "Operating Principles" and the five conditions clearly in one document so as to avoid any misunderstanding in the future as to their intent and purpose. I concur in this suggestion and, accordingly, quoted below are the "Operating Principles" as contained in the Irrigation Report on the Trinidad Project, Colorado, July 1964 (Revised September 1964) and the five conditions suggested in Governor Avery's letter of December 30, 1966:

OPERATING PRINCIPLES

TRINIDAD DAM AND RESERVOIR PROJECT

Preamble

The Trinidad Dam and Reservoir Project as reported in House Document No. 325, 84th Congress, 2d Session, and as authorized by the Flood Control Act of 1958, will be operated in such a manner as to secure the greatest practicable benefits from the

regulation and use of the flows of the Purgatoire River consistent with the laws and policies of the State of Colorado and of the United States including the Arkansas River Compact. The objectives and principles governing the operation of the Trinidad Dam and Reservoir Project to secure such benefits are contained within the following articles.

Article I - OBJECTIVES
Article II - DEFINITION OF TERMS
Article III- FLOOD CONTROL
Article IV- IRRIGATION
Article V - FISHERY AND RECREATION
Article VI- REVIEW AND AMENDMENT

Article I—OBJECTIVES

The operation of the Trinidad Dam and Reservoir involves the regulation of the flows of the Purgatoire River for flood control, irrigation use, and recreation including a permanent fishery pool. The project plan provides for:

1. Control of floods originating above the reservoir for benefit of the city of Trinidad and downstream reaches.
2. Optimum beneficial use of the available water for irrigation within the project area consistent with the protection of downstream non-project rights as set forth in House Document No. 325, 84th Congress, 2d Session, which provides:
   (a) Transfer of the storage decree of the Model Land and Irrigation Company for 20,000 acre-feet annually from the present site to the proposed Trinidad Reservoir.
   (b) Storage in the Trinidad Reservoir of flood flows originating on the Purgatoire River above the dam site which would otherwise spill from John Martin Reservoir.
   (c) Storage in Trinidad Reservoir of the winter flows of the Purgatoire River historically diverted for winter irrigation of project lands.
3. The maintenance of a minimum pool for enhancement of recreation and fishery values.

4. The construction of the Trinidad Dam and Reservoir with the following allocated capacities:

Flood control	51,000 acre-feet
Irrigation	20,000 acre-feet
Permanent fishery pool	4,500 acre-feet
Joint use*	39,000 acre-feet
Total capacity	114,500 acre-feet

* For irrigation and sediment accumulation

Article II—DEFINITION OF TERMS

Definition of terms as used herein:

1. "Reservoir" means the reservoir presently planned and authorized for construction on the Purgatoire River above the city of Trinidad, Colorado.
2. "District" means the Purgatoire River Water Conservancy District, that entity created and existing under laws of the State of Colorado to contract for repayment to the United States of an appropriate share of the project costs allocated to the irrigation use. The District shall also be the agency responsible for the regulation of irrigation water supplies within the District boundaries in the manner set forth therein.
3. "Unused Sediment Capacity" means that portion of the 39,000 acre-feet of reservoir capacity allocated to joint use but unoccupied by sediment at any given time.
4. "Irrigation Capacity" means the 20,000 acre-feet of reservoir capacity allocated to irrigation plus the unsedimented portion of the joint use capacity.
5. "Permanent Fishery Pool Capacity" means the 4,500 acre-feet of reservoir capacity allocated to fishery and recreation.
6. "Permanent Fishery Pool" means the quantity of water stored in the permanent fishery pool capacity.
7. "Flood Control" means the temporary storage of flood waters at any reservoir pool level as necessary to alleviate flood damages through the city of Trinidad and downstream reaches.

8. "Flood Control Capacity" means the 51,000 acre-feet of capacity exclusively allocated to flood control lying initially above m.s.l. reservoir elevation 6229.6.
9. "Reservoir Inflow" is to be expressed in mean daily cubic feet per second of time and means that total flow of water entering the reservoir, comprising measured flows at the inflow gaging stations and other unmeasured inflows entering the reservoir, less such flow of water as may be acquired by the State of Colorado for filling and maintaining the permanent fishery pool.
10. "District Irrigable Area" means only the 19,717 acres of Class 1, 2 and 3 irrigable lands to be served lying within District boundaries.
11. "Irrigation Season" means that period of the year, as determined annually by the District, during which water may be beneficially applied to the District irrigable area, provided the irrigation season will not begin earlier than April 1 or end later than October 15, except as modified by the District with the consent of the Secretary of Interior.
12. "Nonirrigation Season" means that period of the year other than the irrigation season.
13. "District Storage Right" means those rights under which the District may store water in the irrigation capacity for use on the District irrigable area.
14. "District Water Supply" means that water supply of the Purgatoire River subject to District administration for irrigation use within the District irrigable area.
15. "Colorado State Engineer" means the Colorado State Engineer or such other administrative agency having jurisdiction and control over the distribution of the waters of the State of Colorado.
16. "Operating Agency" means the U.S. army Engineer District, Albuquerque, New Mexico, Corps of Engineers.

Article III—FLOOD CONTROL

Trinidad Reservoir shall be operated for flood control benefits in accordance with regulations prescribed by the Secretary of the Army and the following operating principles:

1. All potentially damaging flood inflows shall be temporarily detained as necessary to limit the flow insofar as possible to a nondamaging flow,currently estimated to be 5,000 c.f.s., downstream from the Trinidad Reservoir.
2. All flood waters stored in the flood control capacity shall be released at the maximum nondamaging rate insofar as practicable.
3. Any inflow, other than that stored for irrigation use, temporarily retained below the bottom of the flood control capacity for flood control purposes, shall be released by the operating agency at such a rate, time, and quantity as may be ordered by the Colorado State Engineer, but within nondamaging flow in the channels below the reservoir.

Article IV—IRRIGATION

Administration of the irrigation capacity in Trinidad Reservoir and the distribution of water to the District irrigable area will be made by the District in accordance with House Document No. 325, 84th Congress, 2d Session, and these operating principles. Agreements, satisfactory to the Secretary of the Interior, shall be entered into between the District and the ditch companies and other owners of affected water rights to insure that these principles and the operation described herein shall be adopted.

The principles and provisions under which the District will administer water supplies to the District irrigable area are contained in the following four parts of this Article: "Water Rights", "Limits of Land and Water Use", "District Water Supply", and "Operation and Exercise of Water Rights".

A. Water Rights

Accomplishment of the following conditions is necessary under the laws of the State of Colorado to provide the District with

the right to regulate the flows of the Purgatoire River in the manner described herein:

1. The water users within the District shall assign the right to the exercise of all the decreed direct flow water rights within the District boundaries to the District for administration by the District at such times and to the degree outlined in these principles. The right to the exercise of the following water rights, all in water District No. 19, shall be so assigned.
2. Waters of the Purgatoire River shall be stored by the District in the irrigation capacity of Trinidad Reservoir under rights created under Colorado law; said rights, defined as the District storage right, include:
   (a) The Model storage right, being the right to store 20,000 acre-feet of water from the flows of the Purgatoire River, under reservoir priority No. 10 in Water District No. 19 at a rate of flow not exceeding 700 cubic feet per second of time under date of appropriation of January 22, 1908, as decreed by the District Court of Las Animas County, Colorado, on January 12, 1925, which right shall, by appropriate statutory proceedings be transferred from the place of storage as originally decreed to the site of the reservoir; and

(b) Such other rights to store water in the reservoir as the District may lawfully acquire by appropriation or purchase.

Priority		Amount	
Number	Date	(cfs)	Name of Ditch
3	11/30/61	6.00	Baca
5	3/20/62	4.00	Johns Flood
7	4/30/62	7.00	Chilili
8	11/15/62	2.82	Baca
8	11/15/62	1.18	El Moro
9	1/1/63	1.28	Johns Flood
9	1/1/63	4.72	Hoehne

12	6/30/63	0.50	South Side
13	1/1/64	1.25	Johns Flood
13	1/1/64	3.75	Lewelling & McCormick
15	4/10/64	5.10	Johns Flood
15	4/10/64	0.80	Hoehne
15	4/10/64	2.54	Salas
19	6/1/65	4.00	Lewelling & McCormick
20	10/7/65	7.35	Johns Flood
20	10/7/65	16.65	Hoehne
21	1/1/66	6.00	Burns & Duncan
22	2/1/66	4.00	Salas
27	5/31/66	2.25	Johns Flood
27	5/31/66	2.25	Salas
40	4/30/68	1.40	South Side
64	4/1/73	2.40	Johns Flood
73	11/1/75	6.00	South Side
74	2/17/76	34.00	South Side
75	12/25/76	4.00	South Side
77	3/11/77	1.30	El Moro
77	3/11/77	2.70	Baca
80	4/7/77	18.60	South Side
93	12/15/82	4.00	South Side
95	11/4/83	14.38	Baca
96	11/23/83	16.84	South Side
98	4/30/84	60.00	South Side
103	6/21/86	14.73	Baca
104	10/21/86	10.00	Lewelling & McCormick
106	3/12/87	15.00	Baca
108	2/15/88	9.70	South Side
109	3/1/88	8.00	South Side
137	11/23/97	2.00	V. Florez
145	10/20/02	100.00	Johns Flood
152	12/31/03	2.00	V. Florez
168	1/22/08	200.00	Model
242½	6/12/20	45.56	Baca

B. Limits of Land and Water Use

In order that the Trinidad Dam and Reservoir Project may provide an optimum beneficial use of water for irrigation within the District, the following limitations on land and water use shall apply:

1. The acreage irrigated by the District water supply shall be limited to the 19,717 acres classified as 1, 2 and 3 irrigable land lying within the District boundaries. These 19,717 acres of the District irrigable area shall be composed as nearly as practicable of the following acreages under individual ditches:

Baca	2,428	acres
Chilili	114	"
El Moro	160	"
Johns Flood	1,854	"
Model	6,177	"
South Side	6,359	"
Victor Florez	22	"
Hoehne	1,742	"
Burns & Duncan	322	"
Lewelling & McCormick	378	"
Salas	161	"
Total	19,717	acres

2. All water deliveries to the 19,717 acres of the District irrigable area will be limited during the irrigation season to the irrigation requirements at the farm headgate as determined by the District. Allowance for canal and lateral losses on the individual ditch systems will also be determined by the District.
3. No water deliveries for irrigation of the 19,717 acres of the District irrigable area will be made during the non-irrigation season.

C. District Water Supply

1. That water supply of the Purgatoire River subject to District administration for irrigation use within the District irrigable area, defined as the District water supply, consists of:
   (a) The water stored under the District storage right in the irrigation capacity.
   (b) The stream gains to the Purgatoire River below Trinidad Dam that are divertible to the District irrigable area for irrigation use through the District's exercise of the rights listed in IV.A.1.
   (c) That portion of the reservoir inflow bypassed to the river below Trinidad Dam which is subject to diversion to the District irrigable area through the District's exercise of the water rights listed in IV.A.1.
2. The District water supply will be allocated by the District to the ditches within the District to provide each acre of the District irrigable area an equitable share of the District water supply after allowance has been made for individual ditch transportation losses, provided such allocation will not exceed the irrigation requirements at the farm headgate.

D. Operation and Exercise of Water Rights

The principles governing operation of the irrigation capacity and the District's exercise of the assigned direct flow water rights listed under IV.A.1. and the District storage right are hereinafter set forth as they apply to operations during the entire year as well as to operations during either the non-irrigation season or irrigation season.

1. Non-interference with Downstream Water Rights
   (a) Bypasses to the river shall be made at any time during the year to satisfy downstream senior rights as ordered by the Colorado State Engineer to the extent that such demands are not met by stream gains or otherwise satisfied but are limited to the extent as determined by the Colorado State Engineer to actually

benefit such rights without unnecessary waste through channel losses.

(b) Reservoir inflow in excess of the amount stored under the transferred Model right may be detained in the reservoir at such times as John Martin Reservoir is reasonably expected to spill; to the extent that John Martin Reservoir would have spilled, such detained water shall be considered to have been stored under the District storage right and become part of the District water supply. Such detained water which does not become a part of the District water supply shall be released as called for by the Colorado State Engineer in the amounts and at such times as he shall determine that such releases may be required to avoid a material depletion of the water of the Arkansas River as defined in Article 3 of the Arkansas River Compact, C.R.S., 1953, 148-9-1.

(c) Except as provided by paragraph (b) above, any water temporarily detained in the reservoir as a result of the reservoir inflow exceeding the design outlet capacity of the reservoir shall be released as soon as possible.

(d) All releases from the reservoir, as set forth in (a), (b) and (c) above, shall be passed down the Purgatoire River without interference by water users in the District irrigable area.

2. District Operation, Non-irrigation Season

(a) During the non-irrigation season the District will provide an allowance for stock watering purposes of not more than a daily mean flow of five second-feet or its volume equivalent measured at a gage to be located near and above the Baca River headgate. If the stream gains from the Trinidad Dam to the said gage are insufficient to fulfill the allowance, an equivalent volume of reservoir inflow will be released to satisfy stock water demands within the allowance.

(b) During the non-irrigation season the District will exercise the direct flow water rights and the District storage right only at such times and to the degree as necessary to assure:

(1) That the maximum possible storage of reservoir inflow is accrued.

(2) The stock water allowance is distributed in a manner determined equitable by the District.

3. District Operation—Irrigation Season

(a) During the irrigation season, except at such times as provided for in IV.D.3.(c) below, the District shall exercise the direct flow water rights and the District storage right only at such times and to the degree necessary to assure:

(1) That stream gains to the river below Trinidad Dam which are divertible to the District irrigable area and such reservoir inflow which is bypassed to the river for District irrigation use will be equitably distributed to the District irrigable area as part of the allocated District water supply.

(2) That the District storage right can be fully exercised to store reservoir inflow in excess of that bypass to the river as may be required under D.1.(a) and D.3.(a)(1) above.

(b) During the irrigation season water stored in the irrigation apacity will be released as needed to fulfill or partially fulfill the irrigation requirements of the District irrigable area as part of the allocated District water supply.

(c) During the irrigation season, when the irrigation capacity is empty as determined by the District, the District will relinquish its exercise of the direct flow water rights provided that if the reservoir inflow and stream gains below Trinidad Dam which are divertible to the District irrigable area exceed the irrigation requirement and such excess is storable under the District

storage right, the District will resume the exercise of the direct flow rights and exercise of the District storage right as in D.3.(a)(2) above.

4. Evaporation and Seepage Losses

In the accounting for water in storage, evaporation and seepage losses due to water stored in the irrigation capacity shall be determined using the most recent data available by the Colorado State Engineer and the District with the cooperation of the operating agency.

Article V—FISHERY AND RECREATION

The permanent fishery pool shall be operated in accordance with the following principles:

1. Water for the initial and subsequent fillings and for replacing evaporation and seepage losses will be acquired by the State of Colorado without interference to the District water supply or without additional cost to the District or the United States for the Trinidad Project as envisioned in House Document No.325.
2. In the accounting for water in storage, evaporation and seepage losses due to the permanent fishery pool shall be determined using the most recent data available by the Colorado State Engineer and the District with the cooperation of the operating agency.
3. There shall never be any release of water from the permanent fishery pool except upon the request of the Colorado Game, Fish, and Parks Commission to the Colorado State Engineer.

Article VI—REVIEW AND AMENDMENT

These operating principles may be subject to review and amendment not more than once a year at the request of any of the parties' signatory; provided, that at least one review shall be accomplished within the first 10 years following completion of the Trinidad Dam and at least one review be accomplished every 10 years thereafter. The primary object of such reviews

will be obtaining optimum beneficial use of water as conditions change, operating experience is gained, and more technical data become available.

FIVE CONDITIONS

State of Kansas

1. All inflows over established Colorado water rights (1156.05 cfs) be designated flood flows and released as promptly as downstream conditions permit. The only time water so designated may be stored in the conservation pool will be when John Martin Reservoir does not have the capacity to store additional water.

2. Any subsequent amendment of the operating principles should be subject to review and approval of the same interests as provided for in the original procedure.

3. Assurances that there will be no significant increase in water use which would result in a depletion of water yield to other Colorado and Kansas water users.

4. That 5 years after beginning operation of the Trinidad Reservoir for irrigation purposes, the operating principles be reviewed to determine the effect, if any, the operation has had on other Colorado and Kansas water users and the principles amended as necessary. Each 10 years thereafter reviews should be provided with amendments as needed.

5. All operating records be open for inspection by any qualified representative of the Arkansas River Compact Administration.

The Bureau of Reclamation concurs fully with the "Operating Principles" as set forth above and further agrees with the five conditions noted and suggested by the State of Kansas, also stated above.

To further assure acceptance and complete understanding of the "Operating Principles" and the five conditions, both set forth herein, and consistent with the resolution of the Purgatoire River Water Conservancy District, Dr. James E. Donnelly, President of the District, is joining the Bureau of Reclamation in this letter and so indicates by his signature, approving in its entirety the material set forth herein. Authority for Dr. Donnelly's approval is contained in a resolution passed by the Purgatoire River Water Conservancy District on January 26, 1967 and a copy of this resolution and Dr. James E. Donnelly's letter of January 26, 1967 is attached for your ready reference.

I am sure this adequately documents the intent and purpose of complying with the provisions set forth herein by the parties concerned and I would appreciate early advice from you of the State of Kansas' approval of this action.

Sincerely yours,

/s/ H.P. Dugan

H.P. Dugan
Director

PURGATOIRE RIVER WATER
CONSERVANCY DISTRICT

By: /s/ James E. Donnelly

James E. Donnely, President

Enclosures

cc:

Commissioner, Attention: 400 (with enclosures)

Project Manager, Pueblo, Colorado, Attention: P-100 (with enclosures)

Appendix Item 13

Excerpts from Jt. Ex. 23

Final Report by the U.S. Bureau of Reclamation on the Review of Operating Principles, Trinidad Project, Colorado (December 1988)

Table 4

TRINIDAD PROJECT
EFFECTS ON THE INFLOW TO JOHN MARTIN RESERVOIR
CAUSED BY THE TRANSFER OF WATER OUT OF
THE MODEL STORAGE RIGHT AND THE STORAGE
OF WINTER WATER UNDER THE
DIRECT FLOW RIGHTS—1979-1984.

CASE #/YR			NET EFFECT ON J.M. RES. INFLOW
•••••	•••••	•••••	•••••
CASE #3			
(1HAD/79-84NS)			
1979			−4.0
1980			−9.0
1981			−1.5
1982	•••••	•••••	−5.4
1983			1.7
1984			6.6
TOTAL			−11.6
AVERAGE			−1.9

(Rev. 12/27/88)

[Page 26]

•••••

From a standpoint of injury to downstream users, Case 1 gives the most reasonable results. However, none of the three studies gives a true picture of injury because they do not compare the actual condition to a "without project" condition. We investigated making the "without project" comparison and concluded that there was not sufficient information available to make meaningful comparisons.

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[Pages 28-29]

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The array of studies run on the 1925-57 period show the impacts of the practices of transferring water out of the Model Right and storing winter water under the direct flow rights. The studies also show the impacts of various levels of over irrigation, project operation with a 39,000 acre-foot joint-use pool (instead of the 19,500 acre-foot pool used in the 1961-64 studies) and several levels of bypass to Ninemile and Highland. The studies show the impacts of individual practices and conditions and various combinations of practices and conditions. A description of the various studies was displayed earlier in this section on pages 17 through 20, and the results are shown in Table 5 and Table 6. Tables 5 and 6 show that under most of the practices and conditions studied, the inflow to John Martin Reservoir is larger than that which would have occurred without the Project. The increase of inflow is smaller, however, than would occur if the Project were operated as assumed in the 1961-64 studies.

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[Page 55]

V. CONCLUSIONS

A. The transfer of water from the model storage right to the joint-use pool is a departure from the intent of the Operating Principles.

B. The storage of winter water under the direct flow rights is also a departure from the intent of the Operating Principles.

C. The transfer of water from the Model Right and the storage of winter water under the direct flow rights during the 1979-84 review period has depleted the usable inflow to John Martin Reservoir when compared to the inflow that would have occurred had the Trinidad Project been in accordance with the intent of the Operating Principles.

D. The transfer of water from the Model Right and the storage of winter water under the direct flow decrees, either singularly or collectively, will not cause the future usable inflow to John Martin Reservoir to be less with Trinidad Project in operation than it would have been without the Project. These practices will, however, result in less inflow to John Martin Reservoir than would occur if the water rights were administered in accordance with the intent of the Operating Principles.

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Appendix Item 14

Excerpt from Jt. Ex. 34
House Document No. 325, 84th Cong.
2d Sess. (1956)

House Document No. 325, 84th Cong. 2d. Sess. (1956)
[Pages 3-4]

*****

The district engineer presents as the most suitable plan one providing for a dam and reservoir on the main stem of Purgatoire River at mile 161. The total storage capacity would be 140,700 acre-feet, of which 46,700 is allotted to flood control, 55,000 to conservation, and 39,000 to sediment control. He has coordinated the irrigation aspects of the plan with the Bureau of Reclamation. To obtain maximum beneficial use of the irrigation storage the Bureau of Reclamation suggests five basic operating conditions as follows:

(a) Transfer of the storage decree of the Model Land & Irrigation Co., for 20,000 acre-feet annually, from the present site to the proposed Trinidad Reservoir.

(b) Storage in Trinidad Reservoir of flood flows originating on Purgatoire River above the dam site which would otherwise spill from John Martin Reservoir.

(c) Storage in Trinidad Reservoir of the winter flows of Purgatoire River historically diverted for winter irrigation of project lands.

(d) Regulation in Trinidad Reservoir of summer flows historically diverted to project lands provided that future streamflow records disclose such further regulation would not materially decrease depletions or that any material increase in depletions be compensated by suitable replacement to lands served by John Martin Reservoir.

(e) Storage in Trinidad Reservoir of all flood flows originating on Purgatoire River above the reservoir other than those specified in condition *(b)*, provided that suitable replacement is made to John Martin Reservoir to the extent that such storage in Trinidad Reservoir would result in material depletion of the inflow from

Purgatoire River into John Martin Reservoir and interfere with its operation as established by the Arkansas River compact.
The district engineer states that operation of the irrigation capacity in accordance with conditions *(a)*, *(b)*, and *(c)* can be accomplished under existing Colorado law and the Arkansas River compact and will not significantly deplete the water supply presently available to water users downstream from the project area. He further states that the effects of the operation of the conservation capacity in accordance with conditions *(d)* and *(e)*, on the utilization of John Martin Reservoir for irrigation under the terms of Arkansas River compact are indeterminate from existing streamflow records.

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[Page 29]

97. Operation of the irrigation pool in the Trinidad Reservoir in accordance with the above conditions would require the complete cooperation of all water users in the project area, and the negotiation of suitable agreements and contracts to permit an equitable distribution of the project waters to the entire irrigated area in accordance with the crop requirements. Suitable arrangements may also have to be made with the water users served by the John Martin Reservoir under the terms of the Arkansas River compact if operation of the Trinidad project is to be accomplished under conditions *(d)* and *(e)* above.

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[Page 40]

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144. The chairman, and representative of the United States, Arkansas River Compact Administration, stated that additional supporting data would be needed to substantiate the conclusions

reached in the report before he deemed it advisable to submit specific comments and recommendations for official action by the administration.

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Appendix Item 15

Excerpt from Jt. Ex. 35

Flood Control Act of 1958, 72 Stat. 297

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Arkansas River Basin

The project for the Trinidad Dam on Purgatoire River, Colorado, is hereby authorized substantially in accordance with the recommendations of the Chief of Engineers in House Document Numbered 325, Eighty-fourth Congress, at an estimated cost of $16,628,000.

•••••

Appendix Item 16

Jt. Ex. 44

Letter dated February 1, 1967, from H.P. Dugan, Director, Region 7, U.S. Bureau of Reclamation, to Governor Robert Docking of Kansas

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
REGIONAL OFFICE, REGION 7
BUILDING 20, DENVER FEDERAL CENTER
DENVER, COLORADO 80225

IN REPLY
REFER TO: 7-440

Hon. Robert Docking
Governor of Kansas
Topeka, Kansas

FEB 1- 1967

Dear Governor Docking:

This is in reply to former Governor Avery's letter of December 30, 1966, to us concerning the operation of the proposed Trinidad Reservoir Project on the Purgatoire River near Trinidad, Colorado.

We are pleased to learn that the Kansas Water Resources Board, on the basis of our report on the irrigation function of the proposed Trinidad Project and additional information furnished by our representatives, has concluded essentially that the proposed Trinidad Project will not materially deplete the water supply of the Purgatoire River and John Martin Reservoir providing the project is operated in strict conformity with the guidelines used in the Trinidad Project investigations and the "Operating Principles" contained in the Bureau's Trinidad Irrigation Report.

We wish to assure you that the Bureau of Reclamation in its planning investigations for the proposed Trinidad Project and in developing the "Operating Principles" therefor has been fully aware of and has diligently and conscientiously endeavored to imple-

ment the provisions of the Arkansas River Compact so that the interests of the State of Kansas at all times will be fully protected consistent with the provisions of the Arkansas River Compact.

We appreciate the concern of the State of Kansas with the possibility that the Trinidad Project in its actual operation might have an adverse effect on Kansas and that provision should be made for timely adjustment of Trinidad Project operations to promptly eliminate any such adverse effects, should they occur. This legitimate concern is reflected in the five conditions set forth in former Governor Avery's letter with regard to future review and amendment, if necessary, of the "Operating Principles."

We have discussed this matter with the Board of Directors of the Purgatoire River Water Conservancy District. The Board is unanimous in its resolve that the five conditions in Governor Avery's letter are consistent with the Board's understanding of the "Operating Principles" and the manner of operation of the project as contemplated by the Board, and, further, that the Board approves those conditions to become operable when approved by the Regional Director, Bureau of Reclamation. A certified copy of the Board's January 27, 1967 resolution to that effect and a copy of District President James E. Donnelly's letter to us on this matter are enclosed.

The Bureau of Reclamation concurs fully in the enclosed resolution of the Board of Directors of the Purgatoire River Water Conservancy District and will be governed accordingly in implementing the "Operating Principles."

It would be greatly appreciated if your approval of the Trinidad Project can be received at an early date.

Sincerely yours,

H. P. Dugan
Director

Enclosures 2

Appendix Item 17

Jt. Ex. 45

Letter dated April 11, 1967, from
Governor Robert Docking of Kansas to
H.P. Dugan, Director, Region 7,
U.S. Bureau of Reclamation

A-91

STATE OF KANSAS

OFFICE OF THE GOVERNOR

STATE CAPITOL BUILDING
TOPEKA, KANSAS

ROBERT B. DOCKING
GOVERNOR

April 11, 1967

Mr. H. P. Dugan
Bureau of Reclamation
Regional Office — Region 7
Building 46 — Federal Center
Denver, Colorado

Dear Mr. Dugan:

This will acknowledge receipt of your letters of February 1, 1967, and of March 20, 1967, and the Resolution from the Purgatoire River Water Conservancy District, Colorado.

I appreciate the consideration given by the Bureau of Reclamation and the Purgatoire River Water Conservancy District to the concern of the State of Kansas that the operation of the proposed Trinidad Project not adversely affect the volume of water flowing into John Martin Reservoir.

The resolution of the Purgatoire River Conservancy District dated January 26, 1967, together with the statement of the amended operating principles as contained in your letter of March 20, 1967, have been reviewed and found acceptable.

I, therefore, signify my approval of the amended operating principles referred to above, and offer no objection to the Trinidad Project being completed subject to the acceptance of the amended principles by the Arkansas River Compact Administration.

Sincerely,

Robert B. Docking
Governor

RBD:bj

cc: Mr. R. V. Smrha
Mr. Carl E. Bentrup
Mr. Logan N. Green
Mr. Felix L. Sparks
Mr. George F. Reyher
Mr. Ernest Hofmeister
Mr. Wilbur L. Heckler
Kansas Water Resources Board

Appendix Item 18

Excerpt from Jt. Ex. 99

U.S. Army Corps of Engineers, 1978, revised 1985, Water Control Manual, Trinidad Lake

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1-06. Regulating agencies. The operating principles for Trinidad Dam and Reservoir have been mutually agreed upon by the Corps of Engineers, Bureau of Reclamation, State of Colorado, Arkansas River Compact Administration, and the Purgatoire River Water Conservancy District. The project will be operated in such a manner as to secure the greatest practicable benefits from flood control, irrigation and recreation.

Appendix Item 19

Excerpt from R. vol. 15

October 18, 1990

(Direct Examination of Brent Spronk)

[Pages 132-34]

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SPECIAL MASTER: MR. SPRONK, I TAKE IT THAT THE EFFORT TO INTEGRATE WELLS INTO THE SURFACE WATER SYSTEM COULDN'T BE DONE ON AN ABSOLUTE PRIORITY KIND OF BASIS, COULD IT? IT WAS NOT DONE THAT WAY? WHAT IS GOING THROUGH MY MIND IS, WE LOOKED AT EXHIBITS EARLIER THAT INDICATED THAT IF YOU DIDN'T HAVE A PRIORITY BY 1890 OR SO, YOU WOULD BE OUT OF LUCK A GREAT DEAL OF THE TIME. OBVIOUSLY, ALL OF THE WELLS ARE GOING TO HAVE A MUCH LATER PRIORITY IF YOU ENFORCE THAT SYSTEM STRICTLY.

THE WITNESS: THAT'S A DILEMMA THAT COLORADO FOUND ITSELF IN, YOUR HONOR, TRYING TO FIT A SQUARE PEG IN A ROUND HOLE.

SPECIAL MASTER: WITHOUT GETTING INTO ANY LEGAL INTERPRETATIONS, WHAT DOES THE STATE ENGINEER DO, WHAT EXACTLY?

THE WITNESS: THE STATE ENGINEER ATTEMPTED TO ENACT RULES AND REGULATIONS AND ATTEMPTED TO, OVER TIME, CURTAIL OR REGULATE THE USAGE OF WELLS, THE THEN EXISTING WELLS, SO AS TO CURTAIL THEIR PUMPING AND CUT IT OFF OVER A PERIOD OF TIME. HE ULTIMATELY WAS NOT SUCCESSFUL IN WHOLE, BUT IN PART, IN THAT REGARD IN TERMS OF CURTAILING WELLS. THERE IS SOME EXCEPTIONS TO ALL OF WHAT I'M SAYING, HOWEVER, THOUGH, BEAR IN MIND.

SPECIAL MASTER: HE DID WHAT I WAS SUGGESTING, THAT THERE HAD TO BE SOME MODIFIED APPROACH TO THIS OR IT SEEMED TO ME THAT COLORADO'S PRODUCTION WOULD HAVE BASICALLY BEEN HALTED.

THE WITNESS: THERE WERE ATTEMPTS BY THE STATE ENGINEER TO ENACT, AS IS SAID, RULES AND REGULATIONS. THE ULTIMATE BOTTOM LINE, HOWEVER, YOUR HONOR, IS THAT THE WELLS CONTINUE — THAT WERE IN EXISTENCE CONTINUE TO OPERATE MORE OR LESS AS THEY DID BEFORE WITH VERY LITTLE, IF ANY, ACTUAL REPLACEMENT PROVIDED TO MAKE UP THE DEPLETIONS THAT WERE OCCURRING EVEN AS OF 1969 OR TODAY.

SPECIAL MASTER: NOW, THAT'S YOUR OPINION AS TO HOW WELLS ARE OPERATING TODAY.

THE WITNESS: THAT'S CORRECT, YOUR HONOR.

SPECIAL MASTER: SO YOUR OPINION IS THAT THEY'RE OPERATING BY AND LARGE WITHOUT LIMITATION —

THE WITNESS: THERE ARE SOME RULES AND REGULATIONS, BUT THEY OPERATE BY — BUT EFFECTIVELY THE IMPLEMENTATION OF THOSE RULES AND REGULATIONS ALONG WITH THE WRITTEN PLANS THAT THERE ARE EXCEPTIONS TO THE RULES AND REGULATIONS TO ALLOW THE WELLS TO BASICALLY OPERATE AS THEY WERE BEFORE THE 1969 ACT WITH AN EXCEPTION OF A SMALL AMOUNT OF REPLACEMENT WATER THAT THEY HAVE PROVIDED TO THE STREAM IN TERMS OF TRANSMOUNTAIN RETURN FLOWS.

SPECIAL MASTER: ALL RIGHT.

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Appendix Item 20

Excerpts from R. vol. 18

October 23, 1990

(Direct Examination of Brent Spronk)

[Pages 9-10]

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AFTER REVIEWING THE DOCUMENTS REGARDING THE BACKGROUND AND DEVELOPMENT OF THE TRINIDAD PROJECT, IT WAS CONCLUDED THAT THE CURRENT AND PAST OPERATION OF THE PROJECT IS NOT IN ACCORDANCE WITH THE OPERATING PRINCIPLES OF THE TRINIDAD DAM AND RESERVOIR PROJECT. THERE ARE TWO SIGNIFICANT DEVIATIONS FROM THE OPERATION OF THE PROJECT AS ORIGINALLY CONTEMPLATED BY THE BUREAU OF RECLAMATION WHO ARE THE AUTHORS OF THE OPERATING PRINCIPLES. THESE ARE 1, THE FACT OF TRANSFERS OR ROLLING OF THE CONTENTS OF THE IRRIGATION POOL INTO THE JOINT-USE POOL AND THEREBY ALLOWING AT TIMES MORE THAN 20,000 ACRE FEET TO BE STORED IN TRINIDAD RESERVOIR UNDER THE TRANSFERRED MODEL RIGHT.

"2, NOT COUNTING FOR THE STORAGE OF WINTER FLOW AS A PART OF THE 20,000 ACRE FEET OF STORAGE ALLOWED BY THE TRANSFERRED MODEL RIGHT.

"IN ESSENCE, IN 1984, I CONCLUDED, BASED ON MY INDEPENDENT REVIEW, THAT THOSE TWO PRACTICES WERE NOT IN ACCORDANCE WITH THE OPERATING PRINCIPLES. FOUR YEARS LATER IN THE BUREAU REPORT, THE SAME CONCLUSIONS ARE SET FORTH ON PAGE 55, UNDER ITEMS A AND B ON PAGE 55."

SPECIAL MASTER: MR. SPRONK, IN THAT PARAGRAPH 4.1.5, YOU ARE SAYING THAT THERE ARE TWO SIGNIFICANT DEVIATIONS, AND THEN YOU GO ON TO EXPLAIN THE ROLLOVER PROCEDURE WITH STORAGE OF WINTER FLOWS.

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[Pages 16-17]

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THE WITNESS: THE ADJUSTMENT OR THIS ADJUSTMENT FOR CONSERVATION POOL STORAGE RESULTS IN THE AMOUNT OF WATER WHICH WAS DEPLETED FROM THE CONSERVATION POOL STORAGE, 40 PERCENT OF WHICH WOULD BE ASSOCIATED WITH KANSAS ENTITLEMENT — OR UP TO 40 PERCENT WOULD BE ASSOCIATED WITH KANSAS ENTITLEMENT OF WATER FROM THE CONSERVATION POOL STORAGE.

WHAT I HAVE DONE IN THIS ILLUSTRATION IS TO TAKE THE MONTHLY ANALYSIS THAT I PERFORMED, SUMMARIZE IT IN AN ANNUAL BASIS AS THE BUREAU DID IN THEIR TABLE 4 ON PAGE 16 OF JOINT EXHIBIT 23 SO THAT THESE NUMBERS FOR BOTH CASES 1 AND 2 UNDER THE COLUMNS DEPLETION THROUGH THE CONSERVATION POOL STORAGE DEPICT —

MR. DRAPER: IS THAT CASES 1 AND 2?

THE WITNESS: 1 AND 3. I'M SORRY.

— DEPICT THE QUANTITIES OF WATER DEPLETED FROM THE CONSERVATION POOL STORAGE — TO THE CONSERVATION POOL STORAGE AS A RESULT OF A DEPARTURE FROM THE OPERATING PRINCIPLES AT TRINIDAD RESERVOIR.

SPECIAL MASTER: BASED ON THE CONDITIONS THAT YOU HAVE JUST DESCRIBED?

THE WITNESS: THAT IS CORRECT.

• • • • •

THIRDLY, COLORADO HAS NOT EFFECTIVELY ADMINISTERED THE WATERS OF THE ARKANSAS RIVER TO PROTECT SURFACE WATER USERS, INCLUDING THE STATE OF KANSAS FROM THE USE OF GROUND WATER WITHIN THE ARKANSAS BASIN.

THE HISTORY OF WELL ADMINISTRATION OR LACK THEREOF IS BORNE OUT BY NO ATTEMPTS TO ADMINISTER GROUND WATER USAGE BEFORE 1965 AND AFTER THE 1965 GROUND WATER ACT, WHICH IS COLORADO EXHIBIT 378. THE ATTEMPT TO SHUT DOWN SOME WELLS RESULTED IN FAILURE BECAUSE THE ACTIONS WERE NOT PROPERLY UNDERTAKEN. I REFER THE COURT TO THE *FELLHAUER* CASE, WHICH IS COLORADO EXHIBIT 384.

THE CURRENT RULES AND REGULATIONS — IN OTHER WORDS, THE 1973 RULES AND REGULATIONS — THAT ARE IN EFFECT IN THE ARKANSAS BASIN ARE BASICALLY INEFFECTIVE IN CONTROLLING THE USE AND PUMPAGE BY EXISTING WELLS RESULTING IN NO REDUCTIONS IN PUMPING, AND THEY DO NOT PROVIDE AN ADEQUATE MEANS TO FULLY REPLACE THE STREAM DEPLETIONS CAUSED BY THESE WELLS, SPECIFICALLY THE WRITTEN PLANS THAT HAVE BEEN APPROVED AND USED BY EITHER THE — BY COLORADO OR THE LOWER ARKANSAS WATER MANAGEMENT ASSOCIATION AND THE COLORADO WATER PROTECTIVE AND DEVELOPMENT ASSOCIATION ARE INEFFECTIVE IN REPLACING ALL STREAM DEPLETIONS.

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Appendix Item 21

Excerpts from R. vol. 53

February 13, 1991

(Cross-examination of Timothy Durbin)

[Pages 143-146]

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Q. NOW, LOOKING AT THE MONTHS OF DECEMBER, 1950 THROUGH MARCH, 1951, THE HYDROLOGIC-INSTITUTIONAL MODEL CALCULATES NET DEPLETIONS OF STATE LINE FLOWS; IS THAT CORRECT?
A. WHICH PERIOD ARE WE LOOKING AT NOW?
Q. DECEMBER, 1950 THROUGH MARCH, 1951.
A. DECEMBER, 1950 —
Q. WHICH IS COMPACT YEAR 1951. SO IT IS DECEMBER — SO WE ARE TALKING ABOUT DECEMBER WHICH IS THE NEXT MONTH. IT IS UNDER COMPACT YEAR 1951, DECEMBER, '51, WHICH IS ACTUALLY DECEMBER, 1950.
A. OKAY.
Q. THROUGH MARCH OF 1951. THE HYDROLOGIC-INSTITUTIONAL MODEL IN EACH OF THOSE MONTHS, THE NEXT FOUR MONTHS, CALCULATES A NET DEPLETION OF STATE LINE FLOWS; IS THAT RIGHT?
A. THAT'S CORRECT.
Q. IN COMPARISON F.

THE MODEL ALSO CALCULATES DEPLETIONS OF USABLE STATE LINE FLOWS IN THOSE MONTHS AS WELL; IS THAT CORRECT?

A. YES.
Q. NOW LOOKING BACK AT TABLE 7A OF PLAINTIFF'S EXHIBIT 327, WHICH WAS THE SPRONK WATER ENGINEER'S MEMO, DOES IT MAKE SENSE TO YOU THAT WELL PUMPING IN COLORADO DEPLETED USABLE STATE LINE FLOW DURING THE PERIOD NOVEMBER, 1950 THROUGH MARCH, 1951, WHEN THE KANSAS DIVERSIONS DURING THAT PERIOD WERE ONLY 22 PERCENT OF THE STATE LINE

FLOWS AND THE UNUSED FLOW AT GARDEN CITY EXCEEDED THE FLOW AT THE STATE LINE?

A. YES, IT DOES.

Q. TO DETERMINE — WHY DOES THAT MAKE SENSE TO YOU?

SPECIAL MASTER: YOU ARE GOING TO ASK THAT DANGEROUS QUESTION?

MR. ROBBINS: YES, SIR.

THE WITNESS: IT MAKES SENSE TO ME, BECAUSE A CHANGE IN STATE LINE FLOWS RESULTS IN A CHANGE IN DIVERSIONS AND IT ALSO RESULTS IN A CHANGE IN GROUND WATER RECHARGE. AND THOSE TWO THINGS TOGETHER CONSTITUTE WHAT IS A CHANGE IN USABLE FLOW.

BY MR. ROBBINS:

Q. BUT LOOKING AT THE DIVERSIONS IN 1951 DURING THAT TIME, THEY ONLY DIVERTED 22 PERCENT OF THE WATER, DIDN'T THEY?

A. IF THE DATA IN 7A APPROPRIATELY REPRESENTS WHAT ACTUALLY OCCURRED.

Q. DO YOU HAVE ANY REASON TO DOUBT THAT THE DATA SHOWN IN 7A ARE ACCURATE?

A. NO.

Q. SO IN 1951, DURING THAT PERIOD THEY ONLY TOOK 22 PERCENT OF THE FLOW; RIGHT?

A. RIGHT. BUT IF THERE WAS MORE, THEY WOULD HAVE DIVERTED MORE. THAT IS THE UNDERLYING BASIS OF THE USABLE FLOW CALCULATIONS.

Q. WELL, NOW THERE WAS 52,000 ACRE FEET AT THE STATE LINE AND THE DIVERSIONS WERE 11,000, WHAT MAKES YOU SAY THAT IF THERE WAS MORE THEY WOULD HAVE TAKEN MORE? THERE WAS AT LEAST 40,000 MORE THERE AS IT WAS THAT THEY DIDN'T TAKE.

A. BECAUSE THEIR AVERAGE BEHAVIOR IS THAT REGARDLESS OF WHAT THEY'RE ACTUALLY DIVERT-

ING AND WHAT IS AVAILABLE THAT IF MORE FLOW IS AVAILABLE, THEY WILL TEND TO DIVERT MORE.

Q. SO —

SPECIAL MASTER: MR. DURBIN, LOOKING AT PLAINTIFF'S EXHIBIT 327, TABLE 7A, THIS IS A TABLE PREPARED FROM ACTUAL MEASUREMENTS, IT HAS NOTHING TO DO WITH THE MODEL?

THE WITNESS: IT HAS NOTHING TO DO WITH THE MODEL. THESE ARE ACTUAL DATA.

SPECIAL MASTER: SO YOU HAVE BEEN LOOKING AT THE YEAR 1950, '51. YOU CAN LOOK AT A NUMBER OF YEARS WHERE PERCENTAGE OF DIVERSION OF STATE LINE FLOWS IS FAIRLY LOW. WHY DOES THAT OCCUR? THEY WANT TO HAVE AS MUCH CANAL WATER OR RIVER WATER AS THEY CAN GET. WHY WOULD IT BE, PERCENTAGE FIGURES THAT ARE DOWN TO 18 PERCENT, 7 PERCENT, 17 PERCENT, 5 PERCENT AND SO ON?

THE WITNESS: BUT ON THE AVERAGE —

SPECIAL MASTER: I GUESS I'M LOOKING AT WINTER. I SHOULDN'T BE DOING THAT.

THE WITNESS: I THINK THAT'S WHAT MR. ROBBINS HAS US EXAMINING NOW IS THE WINTERTIME.

SPECIAL MASTER: OKAY. I UNDERSTAND IF IT IS WINTER, IT WOULD MAKE A DIFFERENCE. I WAS THINKING THAT WAS A YEARLY PERCENTAGE.

BY MR. ROBBINS:

Q. I'M STILL UNCLEAR. FOR EXAMPLE, IN A YEAR LIKE 1960, WHEN THERE IS APPROXIMATELY 60,000 ACRE FEET AT THE STATE LINE AND KANSAS ONLY TOOK 4,000 ACRE FEET, WHY IF THERE WERE MORE WATER KANSAS WOULD TAKE MORE. THEY PASSED, YOU KNOW, 55,000 ACRE FEET.

A. I THINK THAT IT'S EASIER TO SEE THIS IF WE EXAMINE, FIRST OF ALL, THE SUMMERTIME.

Q. WE CAN LOOK AT THE SUMMER IN TIME. BUT I WANT TO UNDERSTAND IN THE WINTER. YOU SAID THAT UNDER NO CIRCUMSTANCES WOULD A DEPLETION IN STATE LINE FLOWS NOT RESULT IN INJURY TO THE KANSAS WATER USERS, AND I'M INTERESTED, BECAUSE YOU SAY THAT IF THERE IS MORE WATER THEY DIVERT MORE.

A. THAT IS CORRECT.

Q. I'M CURIOUS WHY, FOR EXAMPLE, IN 1960, THERE IS 60,000 ROUND NUMBERS ACRE FEET AT THE STATE LINE, THEY TOOK JUST A LITTLE OVER 4,000, THERE IS 70,000 PASSING GARDEN CITY, AND YOU SAY THAT THERE IS NO WATER THAT COULD BE DEPLETED AT THE STATE LINE WITHOUT DEPRIVING KANSAS WATERS USERS OF USABLE FLOWS?

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[Pages 148-149]

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SPECIAL MASTER: MR. DURBIN, LET'S STEP AWAY FOR A MINUTE FROM THE REGRESSION TABLES AND SORT OF ADDRESS MR. ROBBINS'S POINT IN MORE GENERAL TERMS. HE'S SUGGESTING THAT ANY GIVEN YEAR — AND HE'S USING 1950, '51 AS AN EXAMPLE, BUT I THINK YOU COULD FIND SOME OTHER YEARS THAT WOULD BE SIMILAR — IN ANY GIVEN YEAR, KANSAS IS NOT — JUST STAY WITH THE WINTER FOR JUST A SECOND — KANSAS IN THE WINTERTIME IS NOT DIVERTING BUT SOME FRACTION OF WATER THAT IS AVAILABLE AT THE STATE LINE. AND ASSUMING THAT WE ARE NOT HITTING ONE OF THESE CAPS SO THAT IT BECOMES UNUSABLE, AND THESE CHARTS ALSO INDICATE THAT IN SOME OF THESE SAME YEARS THAT WE ARE LOOKING AT THERE IS ALSO WATER PASSING

GARDEN CITY, HE'S SAYING THAT AT LEAST IN THOSE WINTER MONTHS SHOULDN'T COLORADO PEOPLE BE ABLE TO TAKE MORE WATER — IT SAYS PUMPING, I PRESUME IT COULD BE TAKEN IT ANYWAY — WITHOUT INJURY, THE IDEA BEING THAT IF YOU REDUCE THE STATE LINE FLOWS, IT STILL ISN'T GOING TO MAKE ANY DIFFERENCE, BECAUSE KANSAS ISN'T TAKING ALL OF THE STATE LINE FLOWS THAT ARE THERE. NOW, I THINK IN GENERAL THAT IS THE POINT THAT HE'S TRYING TO MAKE.

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Appendix Item 22

Excerpt from R. vol. 54

February 14, 1991

(Direct Examination of Jeffrey Lefkoff)

[Pages 122-23]

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BY MR. DRAPER:

Q. ARE YOU ABLE TO CATCH — IN THE ADMINISTRATIVE MODULE DAILY TIME STEP, DOES THAT ALLOW YOU TO CAPTURE THE DAILY FLUCTUATIONS IN THE STREAMFLOW?

A. YES. THAT IS THE REASON FOR USING A DAILY TIME STEP IN THE ADMINISTRATIVE MODULE. THERE ARE SOMETIMES SIGNIFICANT DAY-TO-DAY FLUCTUATIONS IN STREAMFLOW. AND THAT OBVIOUSLY IS THE WAY THEY CALL AND SO BY BASING THE ADMINISTRATIVE MODULE ON A DAILY TIME STEP, THE MODEL IS ABLE TO CAPTURE THOSE INTRAMONTH FLUCTUATIONS, BOTH IN STREAMFLOW AND IN DIVERSIONS THAT WOULD OCCUR.

Q. AND DOES THAT ALSO APPLY TO RESERVOIR RELEASES?

A. YES.

Q. ARE THEY DONE ON A DAILY BASIS, ALSO?

A. YES, THAT IS RIGHT.

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[Page 125]

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A. . . . .

DAILY STREAMFLOW, WHICH I DISCUSSED A MOMENT AGO, IS ALSO READ IN. THAT IS DAILY STREAMFLOW AT — ON THE MAIN STEM OF THE ARKANSAS RIVER AT PUEBLO, AND ON THE PURGATOIRE AT LAS ANIMAS.

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Appendix Item 23

Excerpt from R. vol. 82

May 22, 1991

(Direct Examination of Duane Helton)

[Page 139]

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BY MR. ROBBINS:

Q. MR. HELTON, WHY IS THE PRE-COMPACT PUMPING FOR THE YEARS '40 TO '49 LESS IN SOME INSTANCES THAN THE PUMPING ATTRIBUTABLE TO THE PRE-COMPACT WELLS AFTER 1950?

A. BECAUSE OF THE SURFACE WATER SUPPLY THAT WAS AVAILABLE, YOUR HONOR.

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Appendix Item 24

Excerpt from R. vol. 89

February 25, 1992

(Direct Examination of Brent Spronk)

[Pages 40-50]

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BY MR. DRAPER:

Q. MR. SPRONK, WOULD YOU DESCRIBE THE CRITERIA WHICH YOU EMPLOYED IN DETERMINING USABLE STATE LINE FLOWS?

A. THE CONSIDERATIONS I GAVE WERE SEVERAL FOLD. ONE OF THE THINGS THAT I LOOKED AT IS WHETHER OR NOT THE — WHAT AMOUNTS WERE BEING REQUESTED FOR DELIVERY BY KANSAS OF STORED WATER IN JOHN MARTIN WAS MORE OR LESS THAN WHAT WAS ACTUALLY BEING DELIVERED TO THE STATE LINE.

ANOTHER THING THAT I LOOKED AT WAS WHETHER THE STREAMFLOWS BETWEEN THE STATE LINE AND GARDEN CITY WERE AFFECTED BY RAINFALL EVENTS, MAJOR RAINFALL EVENTS. AND THAT WAS INDICATED BY THE DAILY PRECIPITATION RECORDS THAT I UTILIZED—HAD AVAILABLE TO ME. I BASICALLY LOOKED AT JUST EVENTS THAT WERE IN TERMS OF THE AMOUNT OF WATER ON A DAILY BASIS OF RAINFALL, THAT IS ONE INCH PER DAY. I LOOKED AT THOSE LARGE RAINFALL EVENTS AND OBSERVED THE CHANGES IN FLOW AND WHAT CHANGES IN FLOW EXISTED AS A RESULT.

I ALSO CONSIDERED WHETHER OR NOT THE FRONTIER DITCH, WHICH IS THE UPPERMOST DITCH, MOST UPSTREAM DITCH OF THE KANSAS DITCHES, WHETHER IT DIVERTED ALL OR ESSENTIALLY ALL OF THE FLOW AVAILABLE AT THE STATE LINE. AND THERE ARE A FEW OCCASIONS IN THE DRY YEARS WHERE ESSENTIALLY ALL OF THE FLOWS WERE BEING DIVERTED BY THE

FRONTIER DITCH. THAT, FOR INSTANCE, WOULD INDICATE THAT OBVIOUSLY MORE WATER COULD BE USED BY THE OTHER DITCHES.

THE OTHER CONSIDERATIONS WERE WHETHER THE — WHAT I HAVE REFERRED TO AS THE UPPER GARDEN CITY DITCHES, WHETHER THEIR DIVERSIONS ARE MADE UP OR ESSENTIALLY TOOK ALL OF THE RIVER FLOW AS WAS RECORDED AT SYRACUSE. THE UPPER DITCHES, AS THE WAY I HAVE COMBINED THEM, CONSIST OF THE AMAZON DITCH, THE GREAT EASTERN DITCH, AND THE SOUTHSIDE DITCH. AS YOU CAN SEE FROM KANSAS EXHIBIT 20, THOSE ARE THE LOWER THREE—EXCUSE—THOSE ARE THE MIDDLE THREE DITCHES. THERE IS STILL ONE DITCH BELOW THAT, ONE HEAD GATE BELOW THAT, FARMERS DITCH AND GARDEN CITY DITCH. THEY ACTUALLY NOW DIVERT AT A COMMON HEAD GATE. THE UPPER GARDEN CITY DITCHES, THE WAY I DEFINED THEM ARE THE AMAZON DITCH AND THE GREAT EASTERN DITCH, AND THE SOUTHSIDE DITCH.

AND I TOTALLED THOSE DAILY DIVERSIONS AGAIN ON A DAILY BASIS AND COMPARED THOSE WITH THE FLOWS AVAILABLE AT SYRACUSE. AND IF THE ACCUMULATED DIVERSIONS WERE SIGNIFICANTLY GREATER THAN THE FLOW AT SYRACUSE, THEN I CONSIDERED THAT WAS PROBABLY A DAY THEY WERE USING ALL OF THE WATER THAT WAS AVAILABLE TO THEM.

FINALLY—EXCUSE ME, THERE ARE TWO MORE CRITERIA.

YOU WILL RECALL THAT THERE WERE—THAT I MENTIONED EARLIER THERE WERE STREAMFLOW RECORDS ON A DAILY BASIS FOR SOME OF THE INTERVENING DITCHES BETWEEN THE STATE LINE AND GARDEN CITY. THE SYRACUSE GAUGE, FOR IN-

STANCE, THERE WAS A CONTINUOUS RECORD OVER THE WHOLE PERIOD. AT THE OTHER DITCHES, THERE ARE VARYING RECORDS. MOST OF THEM HAVE RECORDS DURING THE LATE '70'S AND EARLY '80'S. THE DAILY AMOUNTS OF FLOW RECORDED AT THOSE GAUGES WERE ALSO UTILIZED FOR THEIR PERIOD OF RECORD. THOSE GAUGES INDICATE THAT THE FLOWS AT TIMES ESSENTIALLY WERE ZERO THERE, ALSO, WERE VERY LOW AT POINTS. AND WHEN THE RIVER DRIED UP AT ONE OF THESE POINTS, IT WAS AN INDICATOR TO ME THAT THEN ALL OF THE WATER THAT WAS THEN AVAILABLE AT THE STATE LINE WAS BEING UTILIZED.

THE CRITERIA THAT I ACTUALLY APPLIED WASN'T A ZERO FLOW, IT WAS 5 CFS AT THOSE GAUGES. SO IF THE FLOW AT THE GAUGES WERE 5 CFS OR LESS, IN MY OPINION, ESSENTIALLY THE RIVER WAS BEING FULLY UTILIZED. THE 5 CFS, I MIGHT ADD, WOULD ACCOUNT FOR RETURN FLOWS OR TRIBUTARY INFLOWS BETWEEN THE GAUGE AND PROBABLY THE POINT OF DIVERSION UPSTREAM. AND I MIGHT ALSO REFLECT THE FACT THAT NOT ALL OF THE FLOWS, 100 PERCENT OF THE FLOWS CAN BE EFFECTIVELY DIVERTED BY THE RIVER HEAD GATE. AT TIMES YOU CAN HAVE LEAKAGE AND UNDER FLOW AROUND THE GAUGE AND THERE WILL BE SOME SMALL AMOUNTS, PARTICULARLY WHEN YOU ARE DEALING WITH A WIDE RIVER CHANNEL.

FINALLY, THE LAST CRITERIA THAT I UTILIZED IN THE DAILY FLOW ANALYSIS WAS WHETHER THE FLOW AT THE GARDEN CITY GAUGE WAS LESS THAN A SPECIFIED AMOUNT. AGAIN, THE GARDEN CITY GAUGE REPRESENTS SORT OF THE BOTTOM END OF THE SYSTEM THAT I LOOKED AT. IT IS LO-

CATED ON KANSAS EXHIBIT 20, AND IS ABOUT 13 MILES BELOW THE LAST DITCH DIVERSION, THAT BEING THE FARMERS DITCH AND GARDEN CITY DITCH DIVERSION DAM.

THE FLOW RATES WHICH I UTILIZED FOR THE GARDEN CITY GAUGE ACTUALLY VARIED OVER TIME. THEY WERE ON THE AMOUNT OF 20 CFS FOR THE TIME PERIOD OF 1950 THROUGH '72, AND 5 CFS STARTING IN U.S.G.S. WATER YEAR 1973.

THE REASON FOR THE DECREASE IN THE MIDDLE OF MY STUDY WAS TO ACCOUNT FOR SOME OF THE DISCHARGES THAT OCCURRED THROUGH THE GARDEN CITY POWER PLANT AND BEET PLANT, THAT I BELIEVE THERE HAS BEEN SOME TESTIMONY ABOUT PREVIOUSLY IN THIS CASE. THE 15 CFS CHANGE MORE OR LESS REPRESENTS AN AMOUNT TO ACCOUNT FOR THAT DISCHARGE.

THE DISCHARGE CEASED IN AND AROUND THE EARLY '70'S. I THINK ACTUALLY IN '75 OR '76, THEREABOUTS. BUT IT DECLINED SLOWLY IN THE EARLY '70'S. THAT IS WHY I CUT IT OFF A COUPLE OF YEARS EARLIER.

SPECIAL MASTER: YOU USED 5 CFS BEGINNING IN 1973 AND UNTIL WHAT YEAR?

THE WITNESS: THAT WAS UTILIZED UNTIL THE END OF THE STUDY PERIOD, UNTIL 1985. PRIOR TO THAT, 20 CFS WAS EMPLOYED.

WHENEVER THE FLOW THAT WAS RECORDED BY THE U.S.G.S. SURVEY, OR BASED ON THE ESTIMATE THAT I OBTAINED FROM THE DIVISION OF WATER RESOURCES FROM 1970 THROUGH '85, WAS BELOW THESE AMOUNTS, THEN I CONSIDERED ALL OF THE FLOW THEN OCCURRING AT THE STATE LINE TO BE USABLE.

SPECIAL MASTER: AND IF THE FLOWS WERE ABOVE THOSE AMOUNTS, YOU CONSIDERED THEM NOT TO BE USABLE?

THE WITNESS: YES. I CONSIDERED ANY ADDITIONAL FLOWS THAT WOULD OCCUR AT THE STATE LINE WOULD NOT BE USABLE.

I THINK THAT SUMMARIZES THE GENERAL CRITERIA THAT I APPLIED.

AND THE MANNER IN WHICH I APPLIED THIS CRITERIA WAS TO LOOK AT EVERY DAY IN THE STUDY PERIOD, 1950 THROUGH '85, TO MAKE A DECISION, USING THE DATA THAT WAS AVAILABLE THAT I DESCRIBED AND THESE GENERAL CRITERIA TO JUDGE WHETHER IN MY OPINION ON THAT DAY MORE WATER COULD HAVE BEEN USED OR NOT. IN LOOKING AT, OBVIOUSLY MANY DAYS, AND I DON'T HAVE THE NUMBER IN FRONT OF ME, BUT EACH DAY FROM 1950 THROUGH 1985.

BY MR. DRAPER:

Q. SO HOW DID YOU ACTUALLY GO ABOUT APPLYING THE CRITERIA? DID YOU HAVE A SPREAD SHEET THAT CONTAINED ALL OF THIS INFORMATION?

A. IN ORDER TO LOOK AT THE DATA ON A DAY-BY-DAY BASIS, I DID PUT IT INTO A SPREAD SHEET WHICH WOULD ILLUSTRATE THE DATA AND SOME VARIOUS CALCULATIONS, UTILIZING THE DATA TO HELP INDICATE WHETHER NOT ON A GIVEN DAY WHETHER ALL OF THE FLOW WAS BEING USED. AND AN EXAMPLE OF THAT KIND OF SPREAD SHEET IS EXHIBIT 645.

Q. ALL RIGHT. LET'S TAKE A LOOK AT THAT EXHIBIT, IF YOU WOULD, PLEASE.

A. EXHIBIT 645 IS A SERIES OF 12 TABLES. ONE TABLE—OR ONE PAGE, THAT IS—FOR EACH MONTH DURING THE YEAR 1955. THIS IS A SAMPLE YEAR. THERE ARE ACTUALLY A SIMILAR SET OF PAGES OR

TABLES FOR EVERY OTHER MONTH IN THE STUDY PERIOD 1950 THROUGH 1985. EACH PAGE REPRESENTS ONE MONTH AND HAS THE DAILY VALUES OF THE DATA THAT I DESCRIBED DEPICTED ON IT. THE COLUMNS INDICATE, FOR INSTANCE, THE STATE LINE FLOW. IT ALSO INDICATES WHEN KANSAS IS CALLING FOR WATER, AND WHEN IT IS CALLING, THAT WOULD BE THE FOURTH COLUMN OVER LABELED "KANSAS CALL W/3 DAY LAG." I INCORPORATED A THREE-DAY LAG FOR—TO ADD ONTO THE CALLS TO TAKE INTO ACCOUNT THE TRANSIT TIME BETWEEN JOHN MARTIN AND THE STATE LINE.

THE SECOND COLUMN INDICATES WHETHER THE STATE LINE FLOW WAS IN EXCESS OR SHORTAGE OF THE—LET ME BACK UP. THE SECOND COLUMN OF NUMBERS OTHER THAN THE DAYS IS ENTITLED "EXCESS/SHORTAGE STATELINE FLOW." THAT REPRESENTS THE EXCESS OF SHORTAGE OF THE STATE LINE FLOW AS COMPARED TO THE KANSAS CALL.

NOW, THIS FIRST SHEET, OBVIOUSLY, IS IN OCTOBER AND THE ASTERISKS IN THE THIRD COLUMN WHERE THE COLUMN LABELED "KANSAS CALL W/3 DAY LAG" INDICATE THAT THE RESERVOIR WAS EMPTY ON THOSE DAYS. IF THERE IS AN "N/A" INSIDE OF THAT COLUMN, IT WOULD INDICATE THERE WAS WATER IN THE RESERVOIR, BUT IT WASN'T BEING CALLED THAT DAY.

Q. YOU ARE REFERRING TO THE FIRST PAGE OF EXHIBIT 645?

A. YES, THANK YOU.

MOVING FURTHER OVER IN THE SPREAD SHEET, YOU WILL SEE THAT THERE ARE DAILY VALUES REPORTED FOR SYRACUSE FOR THE GARDEN CITY GAUGE. I ALSO HAVE A COLUMN THERE, WHAT IS

THE FLOW AT GARDEN CITY WHEN KANSAS IS DEMANDING WATER FROM JOHN MARTIN. AND IT WOULD INDICATE A VALUE IN THAT COLUMN, A NUMERICAL VALUE IF THERE WAS A CALL ON ANY GIVEN DAY.

Q. THE COLUMN ENTITLED "FLOW AT GARDEN CITY," IS THAT THE INFORMATION FROM KANSAS EXHIBIT 644?

A. YES, THANK YOU. IF YOU COMPARE 644 FOR THE YEAR 1955, WATER YEAR 1955, THE NUMBERS IN THAT COLUMN WILL BE IDENTICAL TO THE ONES IN 644. 644 WAS THE COMPILATION OF DAILY FLOWS JUST AT GARDEN CITY.

SPECIAL MASTER: LET'S JUST TAKE A LOOK AT THAT COLUMN FOR A SECOND.

THE WITNESS: SURE.

SPECIAL MASTER: USING YOUR 20 CFS CRITERIA, THIS WOULD INDICATE THAT THE ONLY TIME THAT WAS EXCEEDED WAS ON THE 28TH AND 29TH OF THE MONTH WHERE IT WAS 22 CFS. IF YOU GO BACK TO THE STATE LINE FLOWS, THEY ARE 42 AND 41 ON THOSE TWO DAYS. THIS IS MAYBE TOO SMALL A CHANGE TO BE USING AS AN EXAMPLE, BUT I GUESS I DON'T QUITE UNDERSTAND THEN WHAT THE RELATIONSHIP WOULD BE. YOU INDICATED THAT IF MORE THAN 20 CFS DURING THIS PERIOD OF TIME WAS PASSING GARDEN CITY THAT YOU WOULD NOT CALL FOR ADDITIONAL FLOWS. SO DO YOU THEN CONSIDER THAT PART OF THE 42 AND 41 IS NOT USABLE?

THE WITNESS: YOUR HONOR, IF YOU LOOK OVER FURTHER TO THE RIGHT-HAND SIDE OF THE SPREAD SHEET, THERE IS A COLUMN LABELED "SWE USABLE FLOW?"

SPECIAL MASTER: YES.

THE WITNESS: WITH A ZERO EQUALLING "NO" AND A 1 EQUALING "YES." YOU WILL SEE THAT FOR THIS PARTICULAR MONTH, THE FIRST MONTH DEPICTED IN EXHIBIT 645, OCTOBER 1955, THAT ALL OF THE DAYS WERE IDENTIFIED AND DETERMINED TO BE DAYS WHEN ALL OF THE FLOW WAS USED WITH THE EXCEPTION OF THE DAYS FOLLOWING THE 25TH OF OCTOBER AND ON. ALL OF THOSE DAYS WERE NOT DAYS WHEN IN MY JUDGMENT THE FLOW WAS ALL USED. BUT FOR THE FIRST 24 DAYS OF THE MONTH. I DID CONSIDER THAT ALL OF THE FLOW WAS BEING USED.

I HAVE ANOTHER EXAMPLE WE WILL WORK THROUGH THAT MIGHT ANSWER SOME MORE OF YOUR QUESTIONS—

SPECIAL MASTER: ALL RIGHT.

THE WITNESS: —ABOUT HOW THE CRITERIA APPLY.

SPECIAL MASTER: ALL RIGHT.

THE WITNESS: BUT I DON'T KNOW IF YOU WOULD LIKE ME TO DO THAT FIRST OR FINISH THE DESCRIPTION OF THIS TABLE.

SPECIAL MASTER: WHY DON'T YOU FINISH THE DESCRIPTION FIRST?

THE WITNESS: OKAY.

SPECIAL MASTER: THEN LET'S COME BACK TO THIS.

THE WITNESS: THERE ARE COLUMNS FOR EACH OF PRECIPITATION GAUGES AND THEY INDICATE THE—THE VALUES INDICATE WHEN PRECIPITATION OCCURRED AND THE AMOUNT IN EXCESS OF ONE INCH PER DAY. SYR WOULD BE AN ABBREVIATION FOR SYRACUSE, G.C. WOULD BE AN ABBREVIATION FOR GARDEN CITY, AND LAK IS AN ABBREVIATION FOR THE LAKIN PRECIPITATION GAUGE.

BY MR. DRAPER:

Q. DOES THE .1 THAT APPEARS FOR THE 7TH OF THE MONTH INDICATE .1 INCH RAIN OR 1.1?

A. 1.1.

Q. SO THAT IS THE NET—

A. CORRECT.

THE NEXT SET OF COLUMNS WOULD BE ASSOCIATED WITH KANSAS—DAILY KANSAS DITCH DIVERSIONS. THEY ARE LUMPED INTO FOUR DIFFERENT CATEGORIES, THE FIRST CATEGORY BEING THE STATE LINE TO SYRACUSE DIVERSIONS. AND THEY WOULD INCLUDE THE FRONTIER, HOWITT, AND FORT AUBREY DITCH DIVERSIONS.

THE NEXT COLUMN, SYRACUSE TO SOUTH SIDE, WOULD BE THAT REACH OF STREAM THAT INCLUDES THE AMAZON, GREAT EASTERN AND SOUTH SIDE DITCH DIVERSIONS, IN OTHER WORDS, THE UPPER GARDEN CITY DIVERSIONS AS I HAVE DEFINED THEM EARLIER.

FINALLY, THE LAST COLUMN LABELED "BELOW SOUTH SIDE TO GAR. CITY" WOULD INCLUDE THE FARMERS AND GARDEN CITY DITCHES AND THEIR DIVERSIONS.

THE THREE DIFFERENT CATEGORIES ARE THEN ADDED UP IN THE TOTAL—DAILY KANSAS DITCH DIVERSIONS ARE ILLUSTRATED IN THE TOTAL COLUMN UNDER THE "KANSAS DITCH DIVERSION" HEADING.

FINALLY, THERE ARE SOME NET GAIN AND LOSS COLUMNS, WHICH TAKE INTO ACCOUNT THE GAUGE FLOWS AND THE DIVERSIONS IN BETWEEN THOSE GAUGES TO DETERMINE IS THERE A LOSS OR A GAIN IN THAT REACH DURING THAT PARTICULAR DAY.

THE NEXT COLUMN IS THE SYRACUSE LESS UPPER GARDEN CITY DITCH DIVERSIONS AS A INDI-

CATOR OF WHAT WAS GOING ON THAT DAY IN RELATION TO THE ACCUMULATED DIVERSIONS FOR THE UPPER GARDEN CITY DITCHES AS OPPOSED TO THE SYRACUSE. IT WOULD REPRESENT, FOR INSTANCE, ON THE FIRST DAY—OR ON ALL OF THE DAYS IT WOULD BE THE SYRACUSE FLOW LESS THE COLUMN LABELED "SYRACUSE MINUS SOUTHSIDE KANSAS DITCH DIVERSIONS."

THE NEXT TWO COLUMNS INDICATE THE AMOUNT—OR SW USABLE FLOW QUESTION MARK INDICATES WHETHER IN FACT THAT DAY IN MY JUDGMENT WAS A DAY WHEN ALL OF THE FLOW WAS USED OR NOT. AND THE USABLE STATE LINE FLOW AMOUNT JUST CARRIES OVER THE FULL AMOUNT OF THE STATE LINE FLOW WHENEVER A 1 APPEARS IN THE PRIOR COLUMN. AND A ZERO, OF COURSE, WAS FOR THOSE DAYS WHEN A ZERO WAS RECORDED AT THE PRIOR COLUMN. AS AN EXAMPLE, THE FIRST DAY A 1 APPEARS SO THERE IS 27 CFS. IF YOU LOOK OVER TO THE STATE LINE FLOW COLUMN ON THE LEFT-HAND SIDE OF THE PAPER, THERE WAS 27 CFS AT THE STATE LINE.

LIKEWISE, LET'S LOOK AT THE 31ST DAY OF THE MONTH, AND YOU WILL SEE THAT THERE WAS—THERE WAS NO—THERE WAS SOME FLOW THAT WASN'T USABLE, I GUESS IS THE BEST WAY TO PUT IT ON THAT DAY, IN MY JUDGMENT. THEREFORE, THE USABLE STATE LINE AMOUNT, I JUST PUT ZERO IN THERE. SO IT WAS PLUS OR MINUS—I MEAN THE FULL THING OR NOT, THE FULL AMOUNT AT THE STATE LINE, DEPENDING ON THE DECISION AND THE AMOUNT SHOWN IN ANSWERING THE QUESTION WHETHER THERE WAS USABLE FLOW OR NOT THAT DAY.

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Appendix Item 25

Excerpt from R. vol. 109

May 14, 1992

(Cross-examination of Steve Vandiver)

[Pages 68-69]

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Q. LET'S TURN TO 1976, WHICH WOULD BE THE YEAR THAT INCLUDES THE BEGINNING PERIOD FOR THIS CURVE NUMBER 30. IF WE LOOK AT THE PAGE STARTING WITH 1976 AND CONTINUING BACK FOR THE SIX YEARS UNTIL 1982, IS THERE ANYTHING SIGNIFICANT ABOUT THE VALUES HERE THAT WOULD INDICATE TO YOU WHY THERE WASN'T A CHANGE IN THE RATING CURVE?

A. I THINK I HAVE TESTIFIED TO THAT. THERE WASN'T ANY MEASUREMENTS OR THERE WASN'T ANY FLOW ENOUGH TO MEASURE THAT WAS HIGH ENOUGH TO CHANGE THE END OF THE CURVE.

Q. OR ANY SECTION OF THE CURVE; IS THAT RIGHT? IT IS ESSENTIALLY ZERO ALL OF THE TIME?

A. THERE WAS A COUPLE OF LOW FLOW MEASUREMENTS, VERY LOW FLOW MEASUREMENTS, I THINK TWICE DURING THE YEAR, ONE IN MAY AND ONE IN SEPTEMBER, THAT WERE LESS THAN TWO-TENTHS OF A CFS.

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Appendix Item 26

Excerpt from R. vol. 115

May 22, 1992

(Direct Examination of Duane Helton)

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SPECIAL MASTER: WELL, BEFORE THE 1970'S, YOU JUST HAVE SAID THERE WAS REALLY NOT ANY LARGE IMPACT FROM WELLS IN KANSAS.

THE WITNESS: THAT IS CORRECT.

SPECIAL MASTER: SO DURING THE '70'S, WHERE YOU ARE CONCERNED, WE HAD THE SITUATION WHERE BOTH SIDES TENDED TO TAKE WHAT THEY COULD, AND ON A PROPORTIONAL BASIS, ACCORDING TO THEIR RIGHTS. BUT YOU ARE SAYING THAT DURING THAT PERIOD THAT THE WATER THAT KANSAS TOOK IMPACTED COLORADO IN AN ADVERSE WAY?

THE WITNESS: NO, SIR. I WILL NOT SAY THAT THE INCREASED THIRST IN KANSAS CAUSED INCREASED DEMANDS AGAINST CONSERVATION STORAGE DURING THE 1970'S. THE REASON I WON'T SAY THAT IS BECAUSE THE INFLOW INTO THE CONSERVATION STORAGE DURING MOST OF THOSE YEARS AND CERTAINLY DURING THE LATER YEARS WAS RELATIVELY SMALL. AND I BELIEVE THAT KANSAS WOULD HAVE CALLED FOR THE RELEASE OF ALL OF THAT WATER EVEN WITHOUT THE INCREASED THIRST.

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Appendix Item 27

Excerpt from R. vol. 116

May 26, 1992

(Cross-examination of Duane Helton)

[Page 69]

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SPECIAL MASTER: I UNDERSTAND THAT. YOU KNOW, WE HAVE GOT A LOT OF EVIDENCE AND A LOT OF DOCUMENTARY EVIDENCE ON THE MANAGEMENT OF THE PROGRAM THAT COLORADO UNDERTOOK WITH RESPECT TO WELLS. BUT I THINK THE QUESTION WAS, IF YOU TRIED TO OPERATE THE WELLS STRICTLY IN ACCORDANCE WITH THE PRIORITY SYSTEM, THEY WOULDN'T OPERATE VERY OFTEN, WOULD THEY?

THE WITNESS: THAT IS CORRECT.

BY MR. DRAPER:

Q. ISN'T THAT TRUE ALSO OF PRE-COMPACT WELLS?

A. I THINK THAT IS TRUE ALSO.

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Appendix Item 28

Excerpts from R. vol. 127

September 23, 1992

(Direct Examination of Steve Larson)

[Pages 117-121]

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THE OTHER THING — AGAIN, WE ARE TRACKING TWO RUNS OF THE MODEL. WE ARE NOT GOING TO BE TAKING THE ACTUAL HISTORICAL STREAMFLOWS AT THE BASE LINE AND RUNNING A MODEL WITH AN INSTITUTIONAL CONDITION AND COMPARING THE HISTORICAL FLOWS TO THE CALCULATED FLOWS OF THE CONDITION. WE ARE NOT GOING TO BE DOING THAT. WE DON'T DO THAT. WE COMPARE TWO RUNS OF THE MODEL SO THAT WE TRY TO TAKE ADVANTAGE OF THE POTENTIAL FOR ERRORS TO IMPROVE OUR RESULT. AND I THINK WE HAVE SEEN AGAIN THROUGH THE SENSITIVITY STUDIES PROVIDED BY THE U.S. THERE IS — THAT FACT CAN BE SEEN.

SPECIAL MASTER: TELL ME A LITTLE BIT MORE OF YOUR VIEW OF THAT. THAT IS ANOTHER CRITICISM THAT IN FACT THOSE DON'T ALWAYS CANCEL THEMSELVES OUT.

THE WITNESS: ABSOLUTELY, THEY DON'T ALWAYS CANCEL OUT. ALL WE CAN SEE IS THAT THERE IS A LESS SENSITIVITY OF THE DEPLETIONS THAN THERE IS TO THE ACTUAL CALCULATIONS OF STATE LINE FLOWS. AND I THINK, AS I SAID EARLIER, THAT IS A VERY FAVORABLE CONDITION, BECAUSE THE POTENTIAL ERRORS IN THE PARAMETER WILL NOT AFFECT THE DEPLETIONS CALCULATION AS MUCH AS THEY WILL AFFECT STATE LINE FLOW CALCULATIONS.

I DON'T THINK IT IS REALLY POSSIBLE TO LOOK AT THE UNCERTAINTY IN THE ESTIMATES OF DEPLETIONS, WHICH IS REALLY WHAT WE ARE LOOKING AT ANYWAY. I THINK WE ARE GETTING A LITTLE AHEAD OF OUR PRESENTATION HERE. BUT I THINK I TALKED ABOUT THIS EARLIER, YOU CAN USE MONTE CARLO

ANALYSIS TO TRY TO DO THIS. THAT'S BY TRYING — BY LOOKING AT THE UNCERTAINTY IN INDIVIDUAL PARAMETERS, YOU CAN CALCULATE THE UNCERTAINTY IN THE OUTCOME OVER SOME RANGE. BUT AS I SAID EARLIER, I AM NOT SURE THAT REALLY HELPS YOU TOO MUCH FROM A STANDPOINT OF, WELL, IF WE HAD THAT UNCERTAINTY CALCULATED FOR THE COLORADO ANALYSIS AND FOR THE KANSAS ANALYSIS, THEN WE COULD KIND OF COMPARE THE TWO AND SEE WHAT THE RELATIVE AMOUNTS OF UNCERTAINTY WERE IN THE TWO ANALYSES.

I DON'T THINK THAT CAN BE DONE WITH THE COLORADO ANALYSIS JUST BECAUSE OF LOGISTICS. I DON'T THINK IT IS FEASIBLE TO DO IT. WE MIGHT BE ABLE TO DO IT WITH THE H-I-M BY DOING THOUSANDS AND THOUSANDS OF RUNS. I THINK THERE ARE A LOT OF ASSUMPTIONS YOU WOULD HAVE TO MAKE. YOU WOULD HAVE ESTIMATES ON TOP OF ESTIMATES.

HOWEVER, I DON'T THINK THAT CHANGES THE CONCLUSIONS THAT YOU REACH. THAT IS, LIKE, FOR EXAMPLE, SUPPOSE THAT WE ESTIMATED DEPLETIONS OF 50,000 ACRE FEET AND THE MARGIN OF THE UNCERTAINTY IS — LET'S SAY, THE STANDARD DEVIATION OF THE ESTIMATE IS PLUS OR MINUS 30,000, WELL, THAT DOESN'T CHANGE THE FACT THAT WAS THE BEST ESTIMATE THAT YOU CAN PROVIDE. ALL IT TELLS YOU IS THERE IS SOME PROBABILITY THAT THE TRUE VALUE, WHICH WE DON'T KNOW, COULD BE LOWER OR COULD BE HIGHER. AND THE NARROWER WE GET THAT UNCERTAINTY, THE LESS PROBABILITY THAT THE TRUE VALUE LIES FURTHER AWAY FROM THE ESTIMATE THAT WE HAVE. IT DOESN'T CHANGE THE ESTIMATE. THE ONLY WAY THAT I CAN SEE TO REDUCE THAT UNCERTAINTY IS YOU HAVE TO HAVE

MORE DATA, MORE DETAILED DATA, AND WE DON'T HAVE THAT.

SPECIAL MASTER: DO ENGINEERS HAVE BASIC JUDGMENTS ABOUT SOME OF THESE THINGS — APART FROM THE MONTE CARLO ANALYSIS — WHERE YOU LOOK AT THIS, AND YOU SAY MY NUMBER IS A HUNCH, THAT IS THE BEST ESTIMATE, THAT IS WHAT EVERYTHING SHOWS, BUT I COULD BE PRETTY SURE THAT IT IS BETWEEN 90 AND 100, SOMETHING LIKE THAT, THE REAL FACTS ARE SOMEWHERE IN THAT NEIGHBORHOOD?

THE WITNESS: I THINK WE CAN DO THAT FOR THE PREDICTION OF THE STREAMFLOWS. THE PROBLEM IS TRYING TO DO IT FOR THE PREDICTION OF DEPLETIONS, WHICH ARE REALLY THE ESSENCE OF THE ANALYSIS. AND THERE YOU DO HAVE THE CORRELATED ERROR PROBLEM YOU HAVE TO DEAL WITH. AND THE ONLY WAY THAT I KNOW OF GETTING AROUND THAT IS TO DO THE MONTE CARLO ANALYSIS. AND I DON'T KNOW THAT IT IS REALLY FEASIBLE. AND AGAIN, I AM NOT SURE THAT IT HELPS TO MAKE THE DECISION, BECAUSE THE ESTIMATED VALUE STILL IS YOUR BEST ESTIMATE. IT IS JUST MAYBE A HIGHER OR LOWER PROBABILITY THAT THE TRUE VALUE COULD BE DIFFERENT BY SOME AMOUNT OR ANOTHER.

SPECIAL MASTER: ALL RIGHT.

BY MR. DRAPER:

Q. NOW, WE HAVE TALKED ABOUT DIFFERENCES BETWEEN THE TWO MODELS. ARE THERE AREAS IN WHICH THE RESULTS OF THE KANSAS AND COLORADO ANALYSES AGREE?

A. WELL, I THINK IT IS CLEAR FROM BOTH OF THE ANALYSES THAT THERE ARE TRENDS IN STREAMFLOW DEPLETIONS AS A RESULT OF THE INCREASED PUMPING IN COLORADO. I THINK THAT

IS PRETTY UNAMBIGUOUS FROM BOTH OF THE ANALYSES.

SPECIAL MASTER: SAY THAT IN A LITTLE MORE DETAIL.

THE WITNESS: WELL, WE'LL GET TO AN EXHIBIT IN A MOMENT HERE.

SPECIAL MASTER: ALL RIGHT.

BY MR. DRAPER:

Q. I BELIEVE THAT EXHIBIT IS PLAINTIFF'S 695.

IS PLAINTIFF'S EXHIBIT 695 AN EXHIBIT YOU PREPARED?

A. YES, IT IS.

Q. WHAT DOES IT SHOW?

A. THIS SHOWS THE TOTAL ANNUAL DEPLETIONS — AND THIS WOULD BE DEPLETIONS AND ACCRETIONS — FOR THE TWO DIFFERENT ANALYSES. ONE IS THE COLORADO WATER BUDGET ANALYSIS AND THE OTHER IS THE ANALYSIS USING THE H-I-M BUT WITH THE COLORADO PUMPING ESTIMATES. AND THAT IS IN BLUE. THAT IS THE SAME SCENARIO 2 ON EXHIBIT 642.

SPECIAL MASTER: THE BLUE BARS INCLUDE THE COLORADO PUMPING ESTIMATES?

THE WITNESS: THE COLORADO PUMPING ESTIMATES USED IN THE H-I MODEL. NOW, REMEMBER, IT IS NOT —

SPECIAL MASTER: I UNDERSTAND THE DISTRIBUTION MAY NOT BE QUITE THE SAME.

THE WITNESS: EXACTLY. BUT AGAIN, IT IS AN ATTEMPT TO TRY TO PUT THINGS ON A MORE EVEN SCALE FOR COMPARISON PURPOSES.

AND THIS SHOWS THE ANNUAL VALUES FOR EACH YEAR FOR THE TWO ANALYSES, THE COLORADO WATER BUDGET ANALYSIS AND THE HYDROLOGIC-INSTITUTIONAL MODEL.

BY MR. DRAPER:

Q. IS IT POSSIBLE TO DRAW ANY CONCLUSIONS FROM THIS COMPARISON?

A. YES, I BELIEVE IT IS. I THINK YOU CAN LOOK AT THIS EXHIBIT AND SEE THE TREND OF INCREASE IN BOTH OF THE ANALYSES AS A RESULT OF HIGHER LEVELS OF PUMPING. AND IN PARTICULAR, YOU CAN SEE THAT IN THE PERIOD FROM THE MID TO LATE 1970'S THAT BOTH ANALYSES SHOW THAT TO BE THE PERIOD OF HIGHEST DEPLETIONS IN TERMS OF AT LEAST SUSTAINED LEVELS OF THE DEPLETIONS FOR A LONGER PERIOD OF TIME. I THINK IT IS UNAMBIGUOUS TO ME THAT THERE ARE THESE TRENDS IN THE '70'S — THE LATE '70'S, THE PERIOD OF HIGHEST DEPLETIONS. I THINK IT IS CLEAR FROM BOTH ANALYSES THAT THAT'S THE CONCLUSION THAT YOU WOULD DRAW.

.....

[Pages 123-24]

.....

Q. I'M NOW READY TO TURN TO ANOTHER SUBJECT, NAMELY, USABLE FLOW.

MR. HELTON HAS SUGGESTED THAT THE H.C.I. ANALYSIS IS PREFERABLE TO THE SPRONK ANALYSIS WITH RESPECT TO USABLE FLOWS.

DO YOU AGREE WITH THAT, MR. LARSON?

A. NO, I DO NOT.

Q. WHY NOT?

A. WELL, THERE ARE A COUPLE OF REASONS. FIRST OF ALL, THE STREAMFLOWS DURING THE LATE 1970'S AT THE STATE LINE WERE VERY LOW. AND THUS, I THINK DURING THIS PERIOD, IT IS CLEAR

THAT THE USABILITY OF STREAMFLOW IN KANSAS WOULD BE VERY HIGH DURING THAT PERIOD. THIS PERIOD OF HIGH USABILITY IS COINCIDENT WITH THE PERIOD OF HIGH DEPLETIONS THAT WE HAVE SEEN AS CALCULATED BY BOTH OF THE ANALYSES — THAT IS, BOTH THE COLORADO ANALYSIS AND OUR ANALYSIS USING THE HYDROLOGIC-INSTITUTIONAL MODEL — CLEARLY SHOW THE HIGHER DEPLETIONS ARE DURING THIS PERIOD IN THE 1970'S WHEN THE STREAMFLOW WAS VERY LOW. AND AS A RESULT OF THAT, THE H.C.I. METHOD WHICH RELIES ON AVERAGES WILL UNDERESTIMATE THE USABLE DEPLETIONS BECAUSE OF THAT — OF THE COINCIDENT NATURE OF THE HIGH DEPLETIONS AND THE HIGH USABILITY.

Q. AND HOW DOES THAT COMPARE TO THE H.C.I. METHOD?

A. THE H.C.I. METHOD RELIES ON AVERAGES. SO THAT DURING THAT PERIOD, BECAUSE IT IS USING AN AVERAGE CONDITION, WILL UNDERESTIMATE THE AMOUNT OF USABLE DEPLETIONS DURING THE PERIOD WHERE THE USABILITY WAS VERY HIGH.

SPECIAL MASTER: H.C.I. WAS THE ORIGINAL METHODOLOGY SUGGESTED BY MR. DURBIN?

THE WITNESS: YES.

*****

[Pages 132-33]

*****

SPECIAL MASTER: BOTH MR. HELTON AND MR. SCHROEDER HAVE TALKED ABOUT INCREASED

THIRST FOR RECHARGE AS A RESULT OF THE INCREASED PUMPING IN KANSAS.

DO YOU HAVE A COMMENT ON THAT?

THE WITNESS: WELL, I THINK EXHIBIT 698 TENDS TO GO TO THAT ISSUE FROM THE STANDPOINT — AS I UNDERSTAND SOME OF THE CRITICISM — A LOT OF IT IS FOCUSED ON THE LATE PORTION OF THE STUDY PERIOD. AND THE POINT THAT I WANTED TO MAKE WITH EXHIBIT 698 WAS, SO FAR AS 1975, YOU COULD USE EITHER METHOD AND GET VERY COMPARABLE AMOUNTS, DEPLETIONS TO USABLE FLOWS.

THE SECOND POINT THAT I WANTED TO MAKE WAS THAT THE USABILITY IN THE LATE 1970'S, IN MY VIEW, WAS VERY HIGH, NO MATTER HOW YOU EXAMINED IT. THE STREAMFLOWS WERE VERY, VERY LOW. AND AS A CONSEQUENCE, USABILITY OF WATER IN KANSAS WOULD BE VERY, VERY HIGH. AND BECAUSE THAT IS COINCIDENT WITH THE PERIOD WITH BOTH ANALYSES — THAT IS THE ANALYSES PRESENTED BY COLORADO AND THE ANALYSES WE CONDUCTED USING THE HYDROLOGIC-INSTITUTIONAL MODEL — SHOW THE HIGHEST LEVEL OF DEPLETION. I THINK IT IS CLEAR THERE ARE GOING TO BE SIGNIFICANT DEPLETIONS DURING THAT PERIOD. AND BECAUSE THE AVERAGING METHOD OF H.C.I. USES AN AVERAGE DURING THAT PERIOD, THAT EXPLAINS WHY WE GET A DIFFERENCE WHEN WE USE THE SPRONK METHOD. AND SO I THINK MY RESPONSE TO THAT WOULD BE THAT THE USABILITY DURING THAT PERIOD WAS VERY HIGH IRRESPECTIVE OF THOSE KINDS OF CONCERNS.

•••••

Appendix Item 29

Excerpt from R. vol. 128

September 24, 1992

(Cross-examination of Steve Larson)

[Pages 107-108]

•••••

SPECIAL MASTER: IS THAT CORRECT, YOU HAVE SUCH A GENERAL SENSE IN MIND?

THE WITNESS: YES, I HAVE A GENERAL SENSE.

SPECIAL MASTER: THEN I THINK SHE WANTS TO KNOW WHAT IT IS.

THE WITNESS: I THINK YOU CAN SEE BY LOOKING AT THOSE RELATIVE SENSITIVITIES THAT THE SENSITIVITY OF DEPLETIONS TO PARAMETER CHANGES IS SIGNIFICANTLY LESS THAN THE SENSITIVITY OF STATE LINE FLOWS. SO MY SENSE WOULD BE THAT THE UNCERTAINTY IN DEPLETIONS WOULD BE MUCH LOWER THAN THE UNCERTAINTY IN THE STATE LINE FLOWS.

BY MS. WEISS:

Q. WELL, DID YOU THINK DEPLETIONS ARE CALCULATED WITHIN A RANGE OF PLUS OR MINUS 50 PERCENT?

A. I HAVEN'T QUANTIFIED IT.

Q. I UNDERSTAND.

A. BUT I THINK IT IS LESS THAN THAT.

Q. LESS THAN 50 PERCENT?

A. YES.

Q. DO YOU THINK IT IS LESS THAN 20 PERCENT?

A. I'M NOT SURE.

Q. WHAT IS YOUR REACTION TO 10 PERCENT?

A. I'M NOT SURE THERE, EITHER.

•••••

Appendix Item 30

Questions Presented, New Mexico's Brief in Support of Exceptions (Dec. 2, 1982), *Texas v. New Mexico*, 462 U.S. 554 (1983) (No. 65, Original) (excerpt)

A-163

IN THE

Supreme Court of the United States

OCTOBER TERM, 1982

No. 65, Original

STATE OF TEXAS,

Plaintiff

v.

STATE OF NEW MEXICO,

Defendant

UNITED STATES OF AMERICA,

Intervenor

BRIEF IN SUPPORT OF EXCEPTIONS

QUESTIONS PRESENTED

---

1. Whether the Court may rewrite the voting provisions of Article V of the Pecos River Compact to provide for a tie-breaker, thus diluting the voting strength of the party states, eliminating the Compact's requirement of unanimity and foreclosing the right of each state to veto Commission action.

2. Whether the Court should review findings of fact the Commission made in 1962 where Texas, the plaintiff, disputes their validity and the validity of the Review of Basic Data on which they are based.

(18)

No. 105, Original

Supreme Court, U.S.
FILED
NOV 17 1994
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In The

Supreme Court of the United States

October Term, 1985

STATE OF KANSAS,

Plaintiff,

v.

STATE OF COLORADO,

Defendant,

UNITED STATES OF AMERICA,

Defendant-Intervenor.

COLORADO'S EXCEPTIONS TO THE REPORT OF THE SPECIAL MASTER AND BRIEF IN SUPPORT THEREOF

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In The

Supreme Court of the United States

October Term, 1985

STATE OF KANSAS,

Plaintiff,

v.

STATE OF COLORADO,

Defendant,

UNITED STATES OF AMERICA,

Defendant-Intervenor.

EXCEPTIONS TO THE REPORT OF THE SPECIAL MASTER

The State of Colorado respectfully excepts to the Report of Special Master Arthur L. Littleworth dated July, 1994, as follows:

1. Colorado excepts to the Master's findings that Kansas was not guilty of inexcusable delay in making its well claim and that Colorado was not prejudiced by Kansas' failure to press its claim earlier.

2. Colorado excepts to the Master's ruling that, under Article IV-D of the Arkansas River Compact, pre-compact wells in Colorado are limited to pumping the highest amount pumped in the years during which the Compact was

negotiated and the Master's finding that the highest amount of such pumping was 15,000 acre-feet per year.

3. Colorado excepts to the Master's ruling that increases in usable Stateline flows resulting from the Operating Plan for John Martin Reservoir adopted by the Arkansas River Compact Administration in 1980 were "separately bargained for" and, therefore, should not offset depletions caused by post-compact well pumping in Colorado.

4. Colorado excepts to the Master's ruling that Kansas need only meet the "preponderance of the evidence" test applicable to ordinary civil litigation to prove a breach of Article IV-D of the Arkansas River Compact.

Respectfully submitted,

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No. 105, Original

In The

Supreme Court of the United States

October Term, 1985

STATE OF KANSAS,

Plaintiff,

v.

STATE OF COLORADO,

Defendant,

UNITED STATES OF AMERICA,

Defendant-Intervenor.

BRIEF IN SUPPORT OF COLORADO'S EXCEPTIONS

QUESTIONS PRESENTED

1. Whether the defense of laches is applicable against a state in a controversy between states in this Court.

2. Whether Kansas inexcusably delayed in bringing a claim for damages against Colorado for breach of the Arkansas River Compact from post-compact well pumping in Colorado and whether Colorado was prejudiced by Kansas' delay.

3. Whether Article IV-D of the Arkansas River Compact limits pre-compact wells in Colorado to pumping the highest amount pumped during the years when the Compact was negotiated; and, if so, whether the Special Master was correct in determining that the highest amount pumped during those years was 15,000 acre-feet per year.

4. Whether increases in usable Stateline flows resulting from the Operating Plan for John Martin Reservoir adopted by the Arkansas River Compact Administration in 1980 should offset depletions caused by post-compact well pumping in Colorado.

5. Whether the preponderance of the evidence standard applies in a controversy between states involving an alleged breach of an interstate compact.

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Jt. Exh. 169 (Admitted 5/28/91, RT Vol. 147, 151) 7

KANSAS EXHIBITS

Kan. Exh. 111* (12/6/90) (Admitted 1/23/91, RT Vol. 45 at 84, 88) 20

Kan. Exh. 111*** (Admitted 3/17/92, RT Vol. 99 at 5) 20

Kan. Exh. 129 (Admitted by Order of 11/16/93) 66, 67

Kan. Exh. 205A (Admitted 9/21/90, RT Vol. 4 at 30) 45, 83

Kan. Exh. 447 (Admitted 12/18/90, RT Vol. 36 at 60) 12, 38, 71, 83

Kan. Exh. 448 (Admitted 11/16/90, RT Vol. 30 at 76) 12, 38, 45, 72

Kan. Exh. 689 (Admitted 9/21/92, RT Vol. 125 at 81) 79

REPORT OF THE SPECIAL MASTER

Colorado submits this brief in support of its exceptions to the July, 1994 Report of Arthur L. Littleworth, Special Master (hereinafter the "Report"). The Report sets forth the Master's findings and recommendations on the liability phase of the case. Report at 11. Remedy issues, including damages, were severed pending a determination on liability. *Id.*

JURISDICTION

The original jurisdiction of the Court was invoked by the State of Kansas under Article III, Section 2, Clause 2 of the United States Constitution and 28 U.S.C. §1251(a)(1).

ARKANSAS RIVER COMPACT

The Arkansas River Compact is an interstate compact between Colorado and Kansas. The Compact was signed by Commissioners for Colorado and Kansas on December 14, 1948. Jt. Exh. 1.[1] The Compact became effective on May 31, 1949, after it was ratified by the legislature of each state and consented to by Congress. Arkansas River Compact, Art. IX-A; Act of May 31, 1949, Ch. 155, 63 Stat.

[1] Exhibits and the reporter's transcript are cited in this brief in the same way the Master cited them in his Report. Report at xvi, 12-13.

145 (1949) (Jt. Exh. 2).[2] The provisions of the Arkansas River Compact are set forth in Exhibit 1 of the Appendix to the Report. Report-App. at 1-17.

STATEMENT OF THE CASE

In March 1986, Kansas was granted leave to file this action against Colorado. 475 U.S. 1069 (1986). In its complaint, Kansas alleged that Colorado had violated the Arkansas River Compact. The Special Master's Report describes the major issues and claims of the parties. Report at 58-64.

In his Report, the Master recommends that the Court find that post-compact well pumping in Colorado has violated Article IV-D of the Arkansas River Compact. Report at 336. He also recommends that the Court find that Kansas failed to prove its claim that operation of the so-called Winter Water Storage Program has violated the Compact. *Id.* Finally, he recommends that the Court confirm his earlier decisions to dismiss all other claims and counterclaims. *Id.* at 336-37.

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[2] The acts of the state legislatures ratifying the Compact are printed in hearings held by Congress on the Compact. *Arkansas River Compact: Hearing on S. 1448 Before the Senate Comm. on Interior and Insular Affairs*, 81st Cong., 1st Sess. 8-9, 18-19 (1949) [hereinafter cited as *Senate Hearing*] (Jt. Exh. 15); *Arkansas River Compact: Hearing on H.R. 4151 Before the Subcomm. on Irrigation and Reclamation of the House Comm. on Public Lands*, 81st Cong., 1st Sess. 10-11, 31 (1949) [hereinafter cited as *House Hearing*] (Jt. Exh. 16).

If the Court affirms his Report, the Master recommends that the case be remanded for further evidence to quantify depletions to usable Stateline flows and for completion of the remedy phase. Report at 290, 337.

One ruling in the Report deserves special notice. Although the Master found that Kansas knew or should have known of the effects of post-compact well pumping in Colorado by 1968 and that Kansas did not complain about such pumping until 1984 at the earliest, he rejected Colorado's defense of laches. Report at 153-70. This ruling, if affirmed by the Court, would allow Kansas to claim damages for depletions to usable Stateline flows dating back to 1950. *Id.* at 164-68.

A. DESCRIPTION OF THE ARKANSAS RIVER BASIN

The Arkansas River originates on the eastern slope of the Rocky Mountains, upstream of the old mining town of Leadville, Colorado. Report at 35. The river begins as a mountain torrent until, near Canon City, it emerges from the mountains into a foothills region. *Kansas v. Colorado*, 206 U.S. 46, 105 (1907). The river then flows through a narrow valley until it reaches the City of Pueblo, where the river leaves the foothills and meanders across the High Plains into Kansas.[3]

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[3] For an excellent description of the Arkansas River Basin in Colorado and Kansas, see U.S. Dept. of Interior, Bureau of Reclamation, *Report on the Upper Arkansas River Basin, Colorado-Kansas* 5-19 (1969) (Jt. Exh. 105).

The Arkansas River Valley between Pueblo, Colorado, and Garden City, Kansas, is what westerners call semi-arid, which means that crops generally cannot be grown without irrigation. Jt. Exh. 105 at 7. Rainfall averages less than 12 inches per year at Pueblo, which gradually increases to an average of slightly more than 18 inches per year at Garden City. *Id.* at 7; Jt. Exh. 140 at 15.

The Arkansas River Valley is a fertile agricultural area, but the water supply in the Arkansas River is not adequate to irrigate the lands along the river and is subject to wide fluctuations not only from year to year, but also from season to season and day to day. Jt. Exh. 105 at 13, 34, 69; *Colorado v. Kansas*, 320 U.S. 383, 396 (1943). Runoff from mountainous areas above Canon City, which is derived primarily from snowmelt, is more uniform from year to year and fluctuates less widely than runoff from foothills and plains drainage areas. Jt. Exh. 5 at 10. As a result, the mountain runoff is more usable and is diverted for irrigation largely in Colorado. *Id.*[4]

More than 60 percent of the average annual mainstem runoff in Colorado occurs during April, May, and June. Jt. Exh. 105 at 60. Lands under most canals experience shortages of surface water after June, when the

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[4] The flow of the river at Canon City (excluding transmountain imports) averaged 499,200 acre-feet per year over the period 1908-84, varying from 217,200 acre-feet in 1940 to 896,600 acre-feet in 1957. Jt. Exh. 29, Table 6D2. In contrast, the flow of the Purgatoire River, the largest tributary of the Arkansas River, measured near Las Animas just upstream from where it joins the Arkansas River, averaged 61,659 acre-feet per year for the period 1950-85, ranging from 4,571 acre-feet in 1975 to 271,256 acre-feet in 1965. Colo. Exh. 836, Col.(2).

snowmelt is generally gone. Jt. Exh. 92 at i. Shortages in Colorado are partially alleviated by reservoir releases, transmountain imports, and ground water pumping. Jt. Exh. 105 at 60.

Tributary inflow below Pueblo provides a portion of the water supply to ditches on the Arkansas River. Jt. Exh. 105 at 58. However, these streams are mostly intermittent and their flow is derived primarily from intense summer rainstorms, so that they do not provide a dependable supply to ditches on the Arkansas River. Jt. Exh. 92 at 5. Most of the flood flow above John Martin Reservoir is now captured by reservoirs in Colorado, but tributaries below John Martin are largely unregulated. Jt. Exh. 105 at 43.[5]

Prior to the construction of John Martin Reservoir, Stateline flows averaged 280,800 acre-feet per year over

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[5] The John Martin Reservoir project (which was originally known as the Caddoa Reservoir Project) was authorized for construction by the U.S. Army Corps of Engineers in 1936 to provide flood control and water conservation in Colorado and Kansas. Arkansas River Compact, Art. III-D. Potential usefulness of the reservoir in facilitating a settlement of the long-standing interstate controversy between Colorado and Kansas was also a consideration in authorization of the project. H. Kramer, *Report to the Congress of the United States on the Proposed Arkansas River Compact Between Colorado and Kansas, reprinted in Senate Hearing, supra* note 2, at 32-33 (1949) [hereinafter cited as "Kramer Report"] (Jt. Exh. 15). General Kramer's report to Congress, together with a General Map of the Arkansas River Basin, is also reprinted in the *House Hearing, supra* note 2, at 34-41 (Jt. Exh. 16). Water stored in the conservation pool of John Martin Reservoir is apportioned between Colorado and Kansas in the Arkansas River Compact. Arkansas River Compact, Art. II-B, V.

the period 1908-1942, varying from 30,900 acre-feet in 1940 to 1,342,400 acre-feet in 1942. Jt. Exh. 5 at 15, Summary Table C. It was expected that the operation of John Martin in accordance with the provisions of the Arkansas River Compact would reduce total Stateline flows by storing flood flows and winter flows which had previously been unused. Report at 54, 144. After the Compact became effective, Stateline flows averaged 144,051 acre-feet per year for the period 1950-85. *Id.* at 53. Even after the Compact became effective, however, it was expected that there would still be substantial amounts of water passing Garden City unused each year which would be available for future development in the basin.[6]

B. HISTORY OF IRRIGATION AND WELL DEVELOPMENT IN THE ARKANSAS RIVER BASIN

Colorado

Irrigation in the Arkansas River Basin in Colorado began in 1859 shortly after the Pikes Peak gold rush, although large-scale irrigation did not begin until 1874, near Rocky Ford. Jt. Exh. 105 at 8.

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[6] Shortly after the Compact became effective, the U.S. Bureau of Reclamation estimated that there was an average of about 48,000 acre-feet per year available for storage in excess of the requirements of water users in Kansas. Colo. Exh. 112 at 3-4, 6. This estimate was based on water which could be diverted at rates of 200 cubic feet per second ("cfs") or less. *Id.* at 6, note b. If flood flows in excess of 200 cfs had been considered, there was more unused water passing Garden City.

The major irrigation systems in the Arkansas River Valley in Colorado were developed primarily during the 1880s. Jt. Exh. 105 at 89. By 1910, a complex system of private irrigation ditches and reservoirs had been developed in Colorado to irrigate approximately 325,000 acres between Pueblo and the Stateline. *Id.* at 8, 58; Report at 37. The river supply was inadequate to irrigate this acreage, and by 1935 seven projects had been constructed to import water into the Arkansas River Basin in Colorado, mostly from the Colorado River Basin (commonly referred to as "transmountain imports"). Jt. Exh. 105 at 8, 83-85. At the time the Compact was negotiated, transmountain imports were averaging approximately 43,000 acre-feet per year. Report at 49. With the completion of the Fryingpan-Arkansas Project, a $432 million water project authorized by Congress in 1962,[7] the United States Bureau of Reclamation estimated that total diversions from the Colorado River Basin into the Arkansas River Basin would average 196,000 acre-feet annually, 38 percent of the average annual flow of the Arkansas River at Pueblo. Jt. Exh. 105 at 2.[8] These transmountain imports

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[7] Act of Aug. 16, 1962, Pub.L. No. 87-590, 76 Stat. 389 (1962) (Jt. Exh. 168); as amended by the Reclamation Development Act of 1974, Pub.L. No. 93-493, Title XI, §1101, 88 Stat. 1497-98 (increasing the appropriation for the Fryingpan-Arkansas Project to $432,000,000) (Jt. Exh. 169). For a description of the Fryingpan-Arkansas Project, see Jt. Exh. 105 at 102-07.

[8] In 1962, the average annual flow of the Arkansas River at Pueblo was about 514,000 acre-feet per year, including transmountain imports. Jt. Exh. 105 at 58. The mainstem flow at Pueblo cited by the Master, Report at 51, is a "composite flow" which was developed by the Kansas experts for use in the Kansas hydrologic-institutional model and includes inflow

are important because the Arkansas River Compact excludes imported water from the apportionment to Kansas. Report at 257; Arkansas River Compact, Art. III-B, IV-A.

Ground water has been used for irrigation for many years in the Arkansas River Valley in Colorado, primarily to supplement surface supplies. Jt. Exh. 105 at 39. According to a careful study made by Colorado, Report at 204, there are 717 large-capacity (100 gallons per minute or greater) irrigation wells in Colorado along the mainstem of the river with appropriation dates earlier than 1950. Colo. Exh. 165*, Table A.1 (Total number of wells, 1949). By 1985, there were about 2,062 large-capacity irrigation wells along the mainstem in Colorado. *Id.*[9] Most of the new wells constructed in Colorado after the Compact became effective were constructed prior to 1965, when the Colorado legislature enacted legislation to authorize the State Engineer to deny well permits on the basis of injury to other water rights. Report at 109-10.

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from Fountain Creek and diversions by the Bessemer Ditch, which actually diverts above Pueblo. Colo. Exh. 831; RT Vol. 113 at 121-24 (Helton). Not all of the water imported into the Arkansas River Basin is used in the Arkansas River Valley below Pueblo. Report at 48-49. Average deliveries of transmountain water below Pueblo have averaged approximately 120,000 acre-feet in recent years. *Id.* at 49.

[9] The Master states that Colorado's total for the number of wells is 2,057. Report at 203, citing Colo. Exh. 851. That exhibit was prepared to compare the number of wells in the Kansas well database and the Colorado well database. For purposes of that comparison, five wells under the Highland Ditch on the lower Purgatoire River were excluded in the Colorado total shown on Colo. Exh. 851.

The amount of ground water pumping in Colorado was a subject of considerable dispute in this case; but there was no dispute that pumping in Colorado had increased substantially after the Compact became effective. Report at 115. According to Colorado's estimates, total pumping along the river from Pueblo to the State-line increased from 41,458 acre-feet in 1950 to a maximum of 285,887 acre-feet in 1976. Colo. Exh. 852. According to Kansas' estimates, pumping increased from 31,201 acre-feet in 1950 to a maximum of 314,749 acre-feet in 1976. *Id.* The amount of pre-compact pumping was subject to much greater dispute, as will be discussed later in this brief.

Kansas

In Kansas, irrigation from the Arkansas River began in 1879. Jt. Exh. 105 at 38; *House Hearing, supra* note 2, at 31 (Statement by George S. Knapp).[10] Irrigated acreage

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[10] The Master, relying on a report prepared by an historian called by Kansas states: "The settlement of Kansas, which was admitted to the Union in 1861, commenced before that in Colorado. It was not until 1876 that Colorado became a state. By the 1870s, the transformation of prairie grasslands in Kansas into irrigated farms and small towns was well underway." Report at 1-2. This gives an erroneous and distorted picture of development in the Arkansas River Basin in Colorado and Kansas upstream from Garden City, Kansas. Settlement and irrigation began first in the Colorado portion of the basin following the Pikes Peak gold rush in 1858. *See Kansas v. Colorado*, 206 U.S. at 107-08 (tables of census data for population and number of acres cultivated in Colorado counties). Significant settlement in Hamilton, Kearny, and Finney Counties in Kansas did not begin until the 1880s. *Id.* at 110-12 (tables of census data for population and number of acres cultivated in Kansas counties).

grew steadily from approximately 15,000 acres in 1895, *Colorado v. Kansas*, 320 U.S. at 399, to about 66,000 acres in 1949. Report at 221. The ditches in Kansas under the Arkansas River Compact are located in Hamilton, Kearny, and Finney Counties and divert from the Arkansas River upstream from Garden City, Kansas. Jt. Exh. 105 at 111-14.[11]

The use of ground water for irrigation in Kansas dates back to about 1890 when windmill-powered pumps were first used. Jt. Exh. 105 at 40. By the late 1930s, many farmers in Kansas supplemented diversions from the river with irrigation wells and some used wells exclusively. *Colorado v. Kansas*, 320 U.S. at 399. In 1962, the Bureau of Reclamation surveyed the irrigation practices under the eight ditches in Kansas and found that the land irrigated in the area had increased to an estimated 75,800 acres. Jt. Exh. 105 at 130. Of this acreage, 71 percent (53,839 acres) used both surface and ground water, 17 percent (12,846 acres) used ground water only, and 12 percent (9,110 acres) used surface water only. *Id.* at 112, 130. In 1988, the Kansas Division of Water Resources did a study of acres irrigated in the ditch service areas and along the river and found a total of 98,274 acres irrigated by surface and ground water. RT Vol. 31 at 72 (Frost).

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[11] The reason there are no ditches below Garden City is due to the physical conditions peculiar to the Arkansas River Basin in Kansas. Kramer Report, *supra* note 5, at 34 (Jt. Exh. 15); *see also House Hearing*, *supra* note 2, at 46-48 (Statements of General Hans Kramer, federal representative to the Arkansas River Compact Commission, and George S. Knapp, Chairman of the Kansas Commissioners) (describing the peculiar physical characteristics of the Arkansas River).

Outside the ditch service areas there was a considerable expansion of irrigated acreage, particularly in the late 1960s and 1970s when center-pivot irrigation sprinkler systems were developed which could irrigate lands which had not been leveled. Report at 221; Jt. Exh. 140 at 13. The U.S. Geological Survey (USGS) estimated that in 1980 there were approximately 351,000 acres in Hamilton, Kearny, and Finney Counties irrigated by surface water and ground water hydrologically connected to the Arkansas River,[12] a more than five-fold increase since the Compact was signed.

Ground water pumping in Kansas increased as irrigated acreage increased.[13] In 1939, the USGS estimated that about 50,000 acre-feet had been pumped for irrigation

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[12] Jt. Exh. 139 at 15 (31,000 acres in the phase I study area); Jt. Exh. 140 at 11 (320,000 acres in the phase II study area). The phase I study area was from the Stateline to the Bear Creek Fault zone. Jt. Exh. 139 at 3. It is shown on Figure 1 of Jt. Exh. 139 at 2. The phase II study area, which included portions of Kearny and Finney Counties, is shown in Figure 1 of Jt. Exh. 140 at 2.

[13] Census figures for Hamilton, Kearny, and Finney Counties for 1929, 1939, 1949, 1959, and 1964 are tabulated by the Bureau of Reclamation in Jt. Exh. 105 at 74. In 1939, irrigated acreage in the three counties was about 56,000 acres. By 1964, it had increased to about 160,000 acres. *Id.* The Bureau of Reclamation noted that the rapid expansion of irrigation in southwestern Kansas had been made possible primarily through the use of ground water, "but not without some serious local problems." *Id.* at 134. The Bureau of Reclamation warned that water levels were declining, that ground water "mining" was occurring in the Garden City area, and that as overdrafts continued, the yield of individual wells would decrease. *Id.* at 40.

in Hamilton, Kearny, and Finney Counties.[14] In 1979 and 1980, the USGS estimated that about 803,000 acre-feet had been pumped in the three counties from wells which were hydrologically connected to the Arkansas River.[15]

Much of the increased pumping in Kansas is from what is commonly referred to as the "Ogallala Aquifer," which underlies the Arkansas River and its alluvium east of the Bear Creek fault zone. Report at 223; *see* Jt. Exh. 138 at 25-28; Jt. Exh. 139 at 2, Fig. 1. The Master states that there is a "major confining zone" which separates the alluvium from the Ogallala Aquifer and that the upper aquifer and the Ogallala Aquifer "act independently." Report at 222. This implies a much greater degree of separation than exists. The USGS did an extensive study of the interrelationship of aquifers in the area in the early 1980s. Jt. Exh. 140. The USGS concluded that as ground water development intensified, "water from the valley and upper aquifer leaked downward through the confining zone to the lower aquifer." Jt. Exh. 140 at 22. The

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[14] Kan. Exh. 447 at 118 (27,100 acre-feet in Finney County); Kan. Exh. 448 at 97-98 (23,000 acre-feet in Hamilton and Kearny Counties).

[15] Jt. Exh. 139 at 8 (65,000 acre-feet pumped in 1979); Jt. Exh. 140 at 11 (738,000 acre-feet pumped in 1980). There were no complete estimates for ground water withdrawals in Hamilton, Kearny, and Finney Counties for the intervening years, although a report prepared by the Kansas Water Resources Board showed a steady increase in irrigated acreage and acre-feet applied in the three counties from 1950 to 1966. Jt. Exh. 86 at 4-5 and county data for Hamilton, Kearny, and Finney Counties. Estimates of ground water withdrawals in Finney County by the USGS also showed a steady increase between 1945 and 1963. Jt. Exh. 138 at 70.

USGS also concluded that "[t]he result of the increased downward leakage of water from the valley and upper aquifers to the lower aquifer has been the water-table decline observed after 1973 in the valley aquifer near Deerfield; . . . " *Id.* at 23. Further, the USGS concluded that "[d]ownward leakage of water from the upper aquifer to the lower aquifer has led to the dewatering of the upper aquifer on the high plains." *Id.* Thus, while there is some separation between the alluvium and the Ogallala Aquifer, the confining zone is not a barrier to movement of ground water and increased pumping from the Ogallala Aquifer in Kansas has led to water level declines in the alluvium and dewatering of the upper aquifer. *Id.* It has also led to increased transit losses between the State-line and the headgates of Kansas ditches. Report at 226.

C. *COLORADO V. KANSAS*

The opinion in *Colorado v. Kansas*, 320 U.S. 383 (1943), sets the backdrop for this case. In *Colorado v. Kansas* this Court rejected a Master's finding that Colorado's use of the waters of the Arkansas River had materially increased, as well as his recommendation for an allocation of the flows of the river between Colorado and Kansas. The Court did so on the basis that Kansas had not proven that Colorado's use had materially increased and that the increase had worked a serious detriment to the substantial interests of Kansas. *Id.* at 400. Among the factors that persuaded the Court that Kansas had not met its burden of proof was the fact that Kansas had taken no

action while improvements based on irrigation went forward in Colorado for twenty-one years. *Id.* at 394. The Court said:

> These facts might well preclude the award of the relief Kansas asks. But in any event, they gravely add to the burden she would otherwise bear, and must be weighed in estimating the equities of the case.

320 U.S. at 394, *citing Washington v. Oregon*, 297 U.S. 517, 526 (1936). The Court also noted that despite the claim that Colorado's use had materially increased, there had been a steady increase in acreage irrigated in Kansas, from 15,000 acres in 1895 to 56,000 acres in 1939. 320 U.S. at 399.

The 1943 opinion made no mention of John Martin Reservoir, which had been authorized by Congress in 1936. Report at 45. At the time of the Court's decision, the reservoir was under construction on the mainstem of the Arkansas River in Colorado, approximately 58 miles upstream from the Stateline. *Id.* Water stored in the reservoir was allocated between the states pursuant to a stipulation signed in 1933; but, the stipulation was only effective until this Court's decision in *Colorado v. Kansas*. *Id.* at 78-79. Although the Court did not address John Martin Reservoir, it encouraged the states to settle their disputes by agreement, 320 U.S. at 392, which they did.

D. THE ARKANSAS RIVER COMPACT

In December 1948, after three years of negotiations, Commissioners for Colorado and Kansas signed the Arkansas River Compact. The Compact became effective

on May 31, 1949, after it had been ratified by the legislature of each state and consented to by Congress.[16]

The Compact does not apportion the waters of the Arkansas River between Colorado and Kansas based on beneficial consumptive use or a Stateline delivery obligation, as in some other interstate water compacts, but instead gives both states the right to make demands for releases from John Martin Reservoir at the times and at the rates specified in the Compact. Arkansas River Compact, Art. V. The Compact did not prohibit future development of the waters of the Arkansas River, "[p]rovided, that the waters of the Arkansas River, as defined in Article III, shall not be materially depleted in usable quantity or availability for use to the water users in Colorado and Kansas under this Compact by such future development or construction." *Id.*, Art. IV-D. General Hans T. Kramer, the federal representative to the Commission which negotiated the Compact and who served as its chairman, Report at 91, 92, explained the history of the negotiations in a letter to the U.S. Army Corps of Engineers in which he described the philosophy of the Compact as "Live and Let Live." Colo. Exh. 57. That philosophy accurately describes the attitude of both states toward post-compact well development for many

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[16] For an excellent summary of the provisions of the Arkansas River Compact, see J. Breitenstein, *The Law of the Arkansas River* at 10-12 (paper presented to the Arkansas-White-Red Basins Inter-Agency Committee meeting, July 18, 1951) (Colo. Exh. 650). Jean Breitenstein was a recognized expert in western water law and was later appointed as Special Master in *Texas v. New Mexico*. *See Texas v. New Mexico*, 482 U.S. 124, 127 (1987).

years. As long as well development was occurring in both states, there were no complaints about such development.[17]

For 30 years after the Compact became effective there were relatively few disputes over the use of waters of the Arkansas River; however, in 1980, Kansas complained about storage in Trinidad Reservoir, a federal reservoir on the Purgatoire River, Report-App. at 56, and thereafter made complaints about the Winter Water Storage Program in Colorado. Report at 312. In late 1983, Kansas hired an engineering firm to investigate the reasons for declining Stateline flows; and, in March 1985, Kansas

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[17] The Master concluded that General Kramer's remarks "relate only to the conservation pool in John Martin and the ability of both states to draw upon it according to need." Report at 106. This interpretation of General Kramer's remarks is not correct. In 1954, General Kramer, who was appointed as the first federal representative to the Arkansas River Compact Administration, discussed the intent of the framers of Article IV-D of the Compact. Minutes of Arkansas River Compact Administration Annual Meeting (Dec. 14, 1954) at 11-13 (Jt. Exh. 19). He stated that "[a]s the author of portions of the Compact and as Chairman of the negotiating commission, he felt that he was in a position to know the meaning of the wording as adopted." *Id.* at 11. After quoting from portions of his report to Congress and the record of the Compact Commission, General Kramer stated that "the basic motivating principle in formulation of the Compact was, 'Live and Let Live.' " *Id.* at 13. In determining whether a depletion from a proposed federal project on the Purgatoire River was material, General Kramer stressed that the principle of "Live and Let Live" should be adhered to. *Id.* Thus, General Kramer believed that the "Live and Let Live" philosophy applied not only to the ability of both states to draw on the conservation pool, but also to future development in the basin.

requested an investigation by the Arkansas River Compact Administration[18] of alleged Compact violations caused by the operation of Trinidad Reservoir, the operation of the Winter Water Storage Program, and, for the first time, post-compact well pumping in Colorado. *Id.* at 153.

E. THE CURRENT DISPUTE

In December 1985, Kansas filed a motion for leave to file a complaint against Colorado, together with a complaint alleging that Colorado had rejected its requests to investigate the alleged Compact violations. Report at 15.

In March 1986, the Court granted Kansas' motion and allowed Colorado 60 days to file an answer. 475 U.S. 1069 (1986). The Master has provided a detailed summary of the procedural history of the case in his Report, including the breakdown suffered by Kansas' chief technical expert witness, Timothy J. Durbin, during cross-examination after numerous errors were brought out in various Kansas exhibits and the Kansas hydrological-institutional model ("H-I Model"), which he had developed to support Kansas' claims. Report at 15-34. The Master has also

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[18] The Arkansas River Compact Administration is an interstate agency created by the Compact. Arkansas River Compact, Art. VIII-A. The membership of the Compact Administration consists of three representatives of each state and a federal representative who acts as chairman but has no vote. *Id.*, Art. VIII-C. The Compact provides that violations of any of the provisions of the Compact or other actions prejudicial thereto which come to the attention of the Compact Administration "shall be promptly investigated by it." *Id.*, Art. VIII-H.

described the substantial delay and the changes to Kansas' case resulting from Mr. Durbin's hospitalization and replacement by other experts.[19] *Id.* at 29-31, 241-48. We will not repeat that full history here, except to note that the numerous errors and poor assumptions in the H-I Model did affect the credibility of Kansas' case. *Id.* at 236-37, 315-16, 335. As the Master states:

> The major changes in Kansas' position and evidence cannot be ignored. For some five years the Kansas experts worked to accumulate the necessary data and to develop the H-I model in order to support the state's claims. Yet after Colorado's cross-examination during trial uncovered numerous errors and shortcomings in the Kansas evidence, and after the trial recess caused by Durbin's hospitalization, Kansas' replacement experts testified to substantially different conclusions than those resulting from the original H-I model. Brent E. Spronk, one of Kansas' replacement experts, testified openly that the results of the original H-I model were not reliable.

Report at 236-37 (footnotes omitted).

After the Kansas replacement experts corrected errors and addressed many of the poor assumptions in H-I Model, and in the process added some 900 lines of new code to the program for the model, the model was

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[19] The Master, over Colorado's objection, granted Kansas' motion for a lengthy continuance to replace Mr. Durbin in part because of "the important sovereign interests that are involved in this case, . . . " Report-App. at 91-92.

unable to predict diversions and Stateline flows accurately, even on a long-term basis. Report at 245-46. The model over-predicted diversions by ditches in Colorado and under-predicted Stateline flows. *Id.* This was due, in part, to the fact that the replacement experts did not attempt to correct all of the shortcomings in the modeling process which had been identified by Colorado's experts. Report at 238-39.[20]

To improve the model's ability to predict diversions and Stateline flows, the Kansas replacement experts resorted to a series of Rube Goldberg-like steps to calibrate the model. First, they reduced the known, measured capacity of many of the Colorado canals in the model to limit the amounts they could divert. Report at 246. Second, they added "diversion reduction factors" to reduce the amounts that could be diverted under some of the larger water rights in Colorado. *Id.* Third, they routed the water which these rights were not permitted to divert because of the "diversion reduction factors" directly to John Martin Reservoir or the Stateline. *Id.* at 246-47.

Colorado's experts were highly critical of the way in which the model had been calibrated by the Kansas

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[20] The H-I Model is a computer program which was developed to predict diversions and streamflows in Colorado from Pueblo to the Stateline. Report at 230-34. In addition to diversions and streamflows, many factors are considered in the model, including reservoir operations, tributary inflows, crop consumption, non-crop consumption, and irrigation pumping. *Id.* at 233-34. As the Master comments, "[i]t represents an enormously difficult task, the complexities of which may not have been fully appreciated when Durbin began to develop the basic structure of the model." *Id.* at 230 (footnote omitted).

replacement experts, Report at 247, although one of Colorado's principal experts did concede, after the errors and poor assumptions had been corrected, that the H-I Model did provide a rough idea, on a long-term basis, of the impacts of well pumping in Colorado. *Id.* at 253. Colorado and the United States' experts did not agree, however, that the model was reliable to evaluate the effects of the Winter Water Storage Program, *id.* at 322-27, and the Master has recommended that the Court find that Kansas failed to prove its claim that operation of the Program has violated the Compact. *Id.* at 335.

To put the errors and poor assumptions in the original H-I Model in perspective, it is helpful to compare the results of the model before and after it was revised. In the original version presented by Mr. Durbin, the model calculated total depletions of Stateline flows from post-compact well pumping in Colorado (before any offset for transmountain return flows) of 1,581,000 acre-feet for the period 1950-85. Report at 235; Kan. Exh. 111* (12/6/90) (Comparison "F"). The revised version of the model calculated total depletions of Stateline flows from post-compact well pumping in Colorado of 852,000 acre-feet. Kan. Exh. 111 * * * (Historical Pumping). Based on the results of the original model, the Kansas claim for the combined effects of post-compact pumping and the Winter Water Storage Program (after transmountain return flows had been accounted for and depletions were limited to depletions of usable Stateline flows) was 917,000 acre-feet. Report at 235. The Kansas claim based on the revised model was reduced to 489,000 acre-feet. *Id.* at 237, 256. However, this amount was based on a new method to calculate depletions to usable Stateline flows. *Id.* at 255.

When depletions to usable Stateline flows were calculated using the method Mr. Durbin had developed and which the Master concluded was the best of several methods presented, Kansas' claim was reduced to 365,400 acre-feet, *id.* at 256 note 97, 40 percent of the original claim.

All of these results were based on Kansas' estimates of post-compact well pumping in Colorado and Kansas' assumption about the amount pre-compact wells in Colorado were entitled to pump after the Compact became effective (*i.e.*, 11,000 acre-feet per year). Report at 183, 202 & note 70. When Colorado's estimates of post-compact well pumping and the amounts pre-compact wells in Colorado were entitled to pump after the Compact became effective were used in the model, the depletions calculated by the model dropped substantially. For example, when reduced to depletions of usable Stateline flows using the Durbin usable flow analysis with the Larson coefficients, which the Master concluded was the best of the methods presented, depletions from post-compact well pumping dropped from 355,900 acre-feet to 230,900 acre-feet. Colo. Exh. 975, Comparisons 6 and 5. When accretions to usable Stateline flows predicted by the model were considered, net depletions dropped to 194,800 acre-feet. *Id.*, Comparison 5. Moreover, these amounts do not include increases to usable Stateline flows resulting from the 1980 Operating Plan for John Martin Reservoir.

While Colorado's experts conceded that post-compact well pumping in Colorado had depleted Stateline flows to some extent, Colorado showed, and the Master found, that Kansas had known about post-compact well

pumping in Colorado for many years, but did not complain about such pumping until 1984, at the earliest. Report at 155-56. Nevertheless, the Master rejected Colorado's defense of laches. *Id.* at 170. Colorado also showed that the Operating Plan for John Martin Reservoir, which was adopted by the Compact Administration in 1980, had increased usable Stateline flows. The Master concluded, however, that the 1980 Plan was not a bar to Kansas' claims and that increases in usable Stateline flows resulting from the Plan should not offset depletions of usable Stateline flows caused by post-compact well pumping. *Id.* at 180-81.

Although the Master concluded that post-compact well pumping in Colorado had violated the Compact and rejected Colorado's equitable defenses, he did not make a finding of the amount of the depletions to usable Stateline flows from post-compact well pumping in Colorado. He did not do so for several reasons. First, he ruled that the "pre-compact pumping allowance" used in the Kansas model should be increased from 11,000 acre-feet per year to 15,000 acre-feet per year and that the post-compact pumping estimates used in the model should be modified for some Colorado adjustments. Report at 199-200, 219. Second, he questioned the comparison used by the Kansas replacement experts to calculate depletions with the revised model. *Id.* at 259-60. Third, he felt that additional evidence was necessary on the issue of accretions to usable Stateline flows calculated by the model. *Id.* at 260, 262-63. Thus, if the Court affirms his rulings on the liability phase, the Master recommends that the case be remanded for further evidence to quantify depletions

to usable Stateline flows and for completion of the remedy phase. *Id.* at 290, 337.

SUMMARY OF ARGUMENT

1. Kansas delayed 29 years after it knew or, in the exercise of reasonable diligence, should have known of facts giving rise to a claim against Colorado for post-compact well pumping in Colorado; Kansas had no justifiable excuse for its delay; and Colorado was prejudiced by Kansas' delay. The policy disfavoring the untimely assertion of rights which underlies the defense of laches is applicable against a state in a controversy between states in this Court. The considerations of public policy which support application of the rule *nullum tempus* to a domestic sovereign when it sues in its own courts are not controlling in a controversy between states in this Court. While Kansas may not be barred from seeking prospective relief, Kansas should be barred from claiming damages prior to 1985 when it first requested an investigation of post-compact well pumping by the Arkansas River Compact Administration.

2. Article IV-D of the Arkansas River Compact does not limit pre-compact wells in Colorado to pumping the highest amount pumped during the pre-compact period. Moreover, the USGS estimates of pumping used by the Special Master to determine the highest amount pumped are not reasonable because there is no data to support those estimates, the estimates are inconsistent with power data that is available, and the person who made those

estimates had died and was not available to explain the data and assumptions used to make those estimates.

3. Under general principles of contract law, increases in usable Stateline flows resulting from the adoption of the 1980 Operating Plan for John Martin Reservoir should offset depletions to usable Stateline flows caused by post-compact well pumping in Colorado.

4. The standard of proof in a controversy between states involving an alleged breach of an interstate compact should be the "clear and convincing" standard, which reflects the significant interest society has in the outcome of such suits and guards against erroneous factual determinations.

ARGUMENT

I. KANSAS' CLAIM FOR DAMAGES SHOULD BE BARRED BY LACHES

In its Answer, Colorado raised laches as an affirmative defense. Report-App. at 32, ¶ 2. In proceedings before the Special Master, Kansas took the position that laches was not applicable against a state. Report at 149. *See Illinois v. Kentucky*, 500 U.S. 380, 388 (1991) ("The Special Master correctly observed that the laches defense is generally inapplicable against a State."); *Block v. North Dakota*, 461 U.S. 273, 294 (1983) (O'Connor, J., dissenting) ("The common law has long accepted the principle *'nullum tempus occurrit regit'* – neither laches nor statutes of limitations will bar the sovereign.").

Special Master Littleworth noted that no interstate compact enforcement case had been found in which the Supreme Court had directly held that laches does or does not apply against a state. Report at 150. He said that one argument in favor of applying laches is that the Court has described its jurisdiction in cases between states as "basically equitable in nature." *Id., quoting Ohio v. Kentucky*, 410 U.S. 641, 648 (1973). He noted, however, that even in equity cases, it is generally held that laches does not apply against a public agency. Report at 150.[21]

The Master concluded, however, that it would be a mistake to decide the issue solely on the basis of "conventional rules of equity." Report at 150. He said that in exercising the "unprecedented" grant of judicial power over controversies between states, "the inquiry really is one of fundamental justice rather than what is the historical or even the current practice of courts exercising less extraordinary powers." *Id.* at 151. Noting cases between states which had referred to a policy disfavoring the untimely assertion of rights,[22] he concluded:

> Clearly, although it is not based on equity jurisprudence as such, the rule to be followed here is that there is some point at which unexcused delay by a state in connection with an interstate apportionment will work to bar relief.

Id. at 152.

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[21] More accurately stated, the rule is that laches does not bar the government when suing to enforce public rights, at least when the government sues in its own courts. *Guaranty Trust Co. v. United States*, 304 U.S. 126, 132-36 (1938).

[22] *Illinois v. Kentucky*, 500 U.S. at 388; *Colorado v. Kansas*, 320 U.S. 383, 394 (1943); *Washington v. Oregon*, 297 U.S. 517, 528-29 (1936); *Missouri v. Illinois*, 200 U.S. 496, 520 (1906).

Although the Master concluded that this rule (which will be referred to as laches[23]) could be applied against a state, he ruled that Kansas had not been guilty of inexcusable delay in making its well claim and that Colorado had not been prejudiced by Kansas' failure to press its claim earlier. Report at 170. Colorado takes exception to these latter rulings.

A. LACHES CAN BE APPLIED AGAINST A STATE IN A CONTROVERSY BETWEEN STATES

Laches is an equitable doctrine which is designed to prevent stale claims for the peace, repose, and welfare of society. As the Court said in *Brown v. County of Buena Vista*, 95 U.S. 157, 161 (1877):

> The law of laches, like the principle of the limitation of actions, was dictated by experience. . . . The lapse of time carries with it the life and memory of witnesses, the muniments of evidence and other means of proof. The rule which gives it the effect prescribed is necessary to the peace, repose and welfare of society.

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[23] International law recognizes laches through the principle of "extinctive prescription." 1 *Oppenheim's International Law* §155c, at 349 (Lauterpacht ed., 8th ed. 1955) ("The principle of extinctive prescription, that is the bar of claims by lapse of time, is recognized in International Law."); I. Brownlie, *Principles of Public International Law* 504 (4th ed. 1990) ("The lapse of time in presentation may bar an international claim in spite of the fact that no rule of international law lays down a time limit.").

See also Penn Mutual Life Ins. Co. v. Austin, 168 U.S. 685, 696-99 (1898) (collecting cases); *Gillons v. Shell Co. of California*, 86 F.2d 600, 609-10 (9th Cir. 1936), *cert. denied*, 302 U.S. 689 (1937) (collecting cases).

The rule that a sovereign is exempt from the operation of statutes of limitations and the consequences of laches (*quod nullum tempus occurrit regit*) has been described as "a vestigial survival of the prerogative of the Crown." *Guaranty Trust Co. v. United States*, 304 U.S. 126, 132 (1938). This judicially created rule continues to be applied by courts in the United States, however, because it furthers the public policy of protecting rights vested in the government (federal or state) from injury and loss by the inadvertence of agents upon which the government must necessarily rely. *Block v. North Dakota*, 461 U.S. at 290; *Guaranty Trust*, 304 U.S. at 132; *United States v. Hoar*, 26 F.Cas. 329 (C.C.D.Mass. 1821) (Story, J.).

The rule *nullum tempus* is not applied in every suit brought by a sovereign, however. When a foreign sovereign sues in our courts, the rule is not applied to shield the foreign sovereign from the operation of statutes of limitation or the consequences of laches. *Guaranty Trust*, 304 U.S. at 135-36. It is therefore important to consider the reason a foreign sovereign is not immune from the operation of statutes of limitation or the consequences of laches when it sues in our courts.

In *Guaranty Trust* the Court noted that, based on the principle of comity, a foreign sovereign is not amenable to suit in our courts without its consent. 304 U.S. at 134. But, the Court pointed out, a foreign sovereign which voluntarily appears in our courts abandons its immunity from

suit and subjects itself to the rules of decision of the forum which it has sought. *Id.* The Court then held that the public interest of the forum did not require the application of the rule *nullum tempus* to a foreign sovereign and the community which it represents. *Id.* at 136. For similar reasons, it would be improper to apply the rule *nullum tempus* in a controversy between states in this Court.

When a state invokes the jurisdiction of this Court to resolve a controversy between states, it is in a position similar to a foreign sovereign which voluntarily appears in the courts of another sovereign. As Justice Story said in *Rhode Island v. Massachusetts*, 37 U.S. (12 Pet.) 657, 751 (1838):

> When, too, the highest courts of a kingdom [*i.e.*, England] have most solemnly declared . . . that when a foreign king is a plaintiff, in a court of equity, it can do complete justice; impose any terms it thinks proper; has him in its power, and completely under its control and jurisdiction . . . ; we ought not to doubt as to the course of a State of this Union; as a contrary one would endanger its peace, if not its existence. [Citation omitted.]

See also Texas v. New Mexico, 482 U.S. 124, 128 (1987) ("By ratifying the Constitution, the States gave this Court complete judicial power to adjudicate disputes among them, [citation omitted] and this power includes the capacity to provide one State a remedy for the breach of another.").

In invoking the jurisdiction of this Court to settle a controversy with another state, a state subjects itself to the rules of decision and the policies which govern the

exercise of jurisdiction by this Court. *Rhode Island v. Massachusetts*, 37 U.S. (12 Pet.) at 737. The framers of the Constitution extended the judicial power of the United States to controversies between states, and gave this Court original jurisdiction of cases in which a state is a party, to provide a peaceful means of settling such disputes. *Georgia v. Pennsylvania R.R. Co.*, 324 U.S. 439, 450 (1945); *Principality of Monaco v. Mississippi*, 292 U.S. 313, 328 (1934); *North Dakota v. Minnesota*, 263 U.S. 365, 372-73 (1923); *Kansas v. Colorado*, 185 U.S. 125, 140 (1902); *Rhode Island v. Massachusetts*, 37 U.S. (12 Pet.) at 725.[24]

In a controversy between states, "this court is called upon to settle that dispute in such a way as will recognize the equal rights of both and at the same time establish justice between them." *Kansas v. Colorado*, 206 U.S. 46, 98 (1907); *see also Rhode Island v. Massachusetts*, 37 U.S. (12 Pet.) at 737. It would be inconsistent with the equality of states and would not establish justice between them for this Court to fail to consider the unexcused delay by a state in asserting its rights and the prejudice to a defendant state from failure to press the claim earlier.

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[24] *See* The Federalist, No. 80, at 534 (J. Cooke ed. 1961) ("It seems scarcely to admit of controversy that the judiciary authority of the union ought to extend to these several descriptions of causes. . . . 4th. to all those which involve the PEACE of the CONFEDERACY, whether they relate to the intercourse between the United States and foreign nations, or to that between the States themselves; . . . "). For a discussion of the unique and unprecedented nature of this grant of jurisdiction, see C. Warren, *The Supreme Court and Sovereign States* 32-37 (1924).

And, as the cases cited by the Master show, the Court has taken into account the policy disfavoring the untimely assertion of rights in weighing the equities and establishing justice between states. *E.g., Colorado v. Kansas*, 320 U.S. at 394 ("These facts [Kansas' delay while improvements based on irrigation went forward for twenty-one years] might well preclude the award of the relief Kansas asks. But, in any event, they gravely add to the burden she would otherwise bear, and must be weighed in estimating the equities of the case.")[25]; *Washington v. Oregon*, 297 U.S. at 528-29 ("Here surely is not the diligence that equity exacts of the suitor who invokes its distinctive jurisdiction."); *Missouri v. Illinois*, 200 U.S. 496, 520 (1906) ("It would be contradicting a fundamental principle of human nature to allow no effect to the lapse of time, however long."); *see also Nebraska v. Wyoming*, 507 U.S. ___, ___, 113 S.Ct. 1689, 1691, 123 L.Ed.2d 317, 332 (1993) (arguments foreclosed by post decree acquiescence); *Virginia v. West Virginia*, 206 U.S. 290, 321 (1907) (failure to enter upon the performance under alleged compact for forty-three years).[26]

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[25] Unlike the Court in *Colorado v. Kansas*, the Master did not require Kansas to prove its case by clear and convincing evidence, but only by a preponderance of the evidence. Report at 69-70. Kansas' delay should "gravely add to the burden she would otherwise bear" and "must be weighed in estimating the equities of the case." Applying laches is the appropriate way to do so.

[26] The reasons for applying the rule *nullum tempus* are strongest when the government seeks to protect rights to lands held as sovereign in trust for the public. *Weber v. Board of State Harbor Comm'rs*, 85 U.S. 57 (1873). Yet, even in boundary cases between states, the policy disfavoring the untimely assertion of

Moreover, it would not serve the Court's primary responsibility as an appellate court to ignore the policy disfavoring the untimely assertion of rights and the prejudice to the defendant state which may arise from delay in interstate compact cases. To apply the rule *nullum tempus* would permit states to dredge up stale claims for damages for violation of interstate compacts and burden this Court with cases which are difficult to determine because of the lapse of time and the loss of evidence. Such cases may also present difficult issues concerning enforcement of the Court's decision.[27]

Thus, it would not lead to the just and equitable settlement of controversies between states, it would not

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rights applies through the doctrines of prescription and acquiescence. *Illinois v. Kentucky*, 500 U.S. at 388. The reason for these separate doctrines in boundary disputes is that unreasonable delay in the assertion of rights will confer jurisdiction and title on another sovereign. *Rhode Island v. Massachusetts*, 37 U.S. (12 Pet.) at 734 ("[A]ll dependent rights are settled when boundary is."). Thus, as with adverse possession, the delay in boundary cases must be substantial before it will constitute prescription or acquiescence. On the other hand, in a dispute where untimely delay only bars a claim for compensation for past injury rather than future enforcement of rights, the delay should be much less to constitute unreasonable delay. *See* I. Brownlie, *Principles of Public International Law* 153, 505 (4th ed. 1990) (distinguishing the principle of "extinctive prescription" (laches) from the doctrine of prescription and acquiescence applied in territorial disputes in International Law).

[27] For example, it is one thing to order a state to pay money damages or repay past under-deliveries of water where there has been an ongoing, albeit good-faith, dispute over obligations under a Compact, as in *Texas v. Mexico*, 482 U.S. at 129-31. It is another thing to impose such a remedy on a state which had no reason to believe it would be sued.

promote the peace of the Union, and it would not serve the Court's primary responsibility as an appellate court to hold that laches cannot be applied against a state in a controversy between states in this Court involving a claim for breach of an interstate compact.

B. KANSAS WAS GUILTY OF LACHES IN MAKING ITS WELL CLAIM

Although the Special Master ruled that Kansas' delay, if unexcused, could bar relief, he concluded that Kansas should not be barred by laches from obtaining relief because of its failure to press its well claim earlier. Report at 170.

In reaching this decision, the Master made two preliminary findings. First, he found that there was no substantial evidence that Kansas knew or should have known about the extent or effect of post-compact well pumping in Colorado before 1968. Report at 169.[28] Second, he found that the record supported Colorado's assertion that Kansas had made no complaint about well pumping in Colorado to the Compact Administration, or indeed to any appropriate Colorado officials, before 1984,

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[28] Although it is not entirely clear from the Report, the Master apparently found that Kansas knew or should have known about the extent of post-compact well pumping in Colorado in 1968 because in that year a report was published at the direction of the Colorado legislature (the "Wheeler Report") which contained estimates of pumping between 1940 and 1965. Report at 159-60.

if the Simons, Li report[29] was considered as such, or otherwise before 1985, when Kansas asked the Compact Administration to undertake an investigation under Article VIII-H of the Compact. *Id.* at 155-56.

Notwithstanding the fact that Kansas had delayed for at least 16 years in making a complaint (1968 to 1984), the Master concluded "that Kansas has not been guilty of inexcusable delay in making its well claim, and that Colorado has not been prejudiced by Kansas' failure to press its claim earlier." Report at 170. Colorado takes exception to these findings. While the Master's findings on these issues may deserve respect, the ultimate responsibility for deciding what are correct findings of fact remains with the Court. *Colorado v. New Mexico*, 467 U.S. 310, 317 (1984). This is particularly true where the Master has misapprehended the considerations which govern the decision. *Id.* at 323.

Cases applying laches provide helpful guidance in this case.[30] Laches has been defined as "the neglect or

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[29] In September 1983, Kansas hired Simons, Li & Associates, Inc., an engineering firm, to make an investigation into declining Stateline flows. Jt. Exh. 88 at 1.1. The report was completed in 1984 and provided to Colorado in June of that year. Exhibit 23 to Colorado's Motion to Stay Based on Kansas' Failure to Exhaust Its Administrative Remedies (filed May 13, 1988). The report formed the basis for Kansas' request for a special meeting of the Arkansas River Compact Administration on March 28, 1985, at which it requested an investigation of alleged Compact violations by Colorado. Exhibit 24 at 6 to Colorado's Motion to Stay.

[30] So far as Colorado is aware, there is no statute of limitations that applies to claims for breach of interstate compact

delay in bringing suit to remedy an alleged wrong, which taken together with lapse of time and other circumstances, causes prejudice to the adverse party and operates as an equitable bar." *A.C. Aukerman Co. v. R.L. Chaides Const. Co.*, 960 F.2d 1020, 1028-29 (Fed.Cir. 1992). *Accord Costello v. United States*, 365 U.S. 265, 282 (1961); *Gardner v. Panama R.R. Co.*, 342 U.S. 29, 31 (1951); *Holmberg v. Armbrecht*, 327 U.S. 392, 396 (1946); *Russell v. Todd*, 309 U.S. 280, 287 (1940); *Southern Pac. Co. v. Bogert*, 250 U.S. 483, 488-89 (1919).[31]

Historically, laches developed as an equitable defense based on the maxim *vigilantibus non dormientibus aequitas subvenit* (equity aids the vigilant, not those who sleep on their rights). *Stone v. Williams*, 873 F.2d 620, 623 (2d Cir. 1989), *cert. denied*, 493 U.S. 959 (1989); *Independent Bankers*

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generally or to breach of the Arkansas River Compact specifically. *See* Report at 164 note 58. However, the jurisdiction of the Court is "basically equitable in nature," *Ohio v. Kentucky*, 410 U.S. 641, 648 (1973), and this Court has looked to doctrines of equity as guides to decisions in cases between states. *Texas v. Florida*, 306 U.S. 398, 405 (1939); *see also Vermont v. New York*, 417 U.S. 270, 277 (1974); *Massachusetts v. Missouri*, 308 U.S. 1, 15 (1939).

[31] In recent years, decisions by Federal Courts of Appeal have distinguished the elements necessary to establish laches from the elements necessary to establish estoppel, something not always clear in older cases applying laches. The distinction is important because it carries over into the effects that the two defenses have on litigation. *E.g., Studiengesellschaft Kohle v. Eastman Kodak Co.*, 616 F.2d 1315, 1326 (5th Cir. 1980); *Advanced Hydraulics, Inc. v. Otis Elevator Co.*, 525 F.2d 477, 479 (7th Cir.), *cert. denied*, 423 U.S. 869 (1975). For that reason, Colorado believes that recent Court of Appeals decisions are particularly helpful on the issue of laches.

Assn. of America v. Heimann, 627 F.2d 486, 488 (D.C.Cir. 1980) (per curiam).

The length of time which may be deemed unreasonable has no fixed boundaries, but rather depends on the circumstances of each case. *Young v. The Key City*, 81 U.S. (14 Wall.) 653, 660 (1872); *Aukerman*, 960 F.2d at 1032 and cases cited therein; *Goodman v. McDonnell Douglas Corp.*, 606 F.2d 800, 805-06 (8th Cir. 1979), *cert. denied*, 446 U.S. 913 (1980). While a statute of limitations may provide a frame of reference, it is not controlling as a measure of equitable relief. *Holmberg v. Armbrecht*, 327 U.S. at 396. As the Court said in that case:

> Such statutes have been drawn upon by equity solely for the light they may shed in determining that which is decisive for the chancellor's intervention, namely, whether the plaintiff has inexcusably slept on his rights so as to make a decree against the defendant unfair. See *Russell v. Todd, supra* (309 US [280] at 289, 84 L.Ed. 761, 60 S.Ct. 527 [(1940)]). "There must be conscience, good faith, and reasonable diligence to call into action the powers of the court." *McKnight v. Taylor*, 1 How (U.S.) 161, 168, 11 L.Ed. 86, 88 [(1843)]. A federal court may not be bound by a State statute of limitation and yet that court may dismiss a suit where the plaintiffs' "lack of diligence is wholly unexcused; and both the nature of the claim and the situation of the parties was such as to call for diligence. . . ." *Benedict v. New York*, 250 U.S. 321, 328, 63 L.Ed. 1005, 1011, 39 S.Ct. 476 [(1919)].

Holmberg v. Armbrecht, 327 U.S. at 396.

For the purpose of laches the relevant time period begins to run when the plaintiff knew or, in the exercise of reasonable diligence, should have known of the facts giving rise to its claim. *Aukerman*, 960 F.2d at 1032; *White v. Daniel*, 909 F.2d 99, 102 (4th Cir. 1990); *Jensen v. Western Irrigation & Mfg., Inc.*, 650 F.2d 165, 168 (9th Cir. 1980); *Studiengesellschaft Kohle v. Eastman Kodak Co.*, 616 F.2d 1315, 1326 (5th Cir. 1980). Laches will not be imputed to one who has been justifiably ignorant of facts which create a cause of action, but a plaintiff must be diligent and make such inquiry and investigation as the circumstances suggest. *Benedict v. New York*, 250 U.S. 321, 328 (1919); *City of New Albany v. Burke*, 78 U.S. (11 Wall.) 96, 107 (1871); *Studiengesellschaft Kohle*, 616 F.2d at 1326; *Potash Co. of America v. International Minerals & Chemical Corp.*, 213 F.2d 153, 155 (10th Cir. 1954).

1. Kansas Knew or Should Have Known of the Facts Giving Rise to Its Claim by 1956

The first question in the laches analysis is whether Kansas was diligent in asserting its rights from the time it knew or, in the exercise of reasonable diligence, should have known of its claim. *Aukerman*, 960 F.2d at 1032; *White v. Daniel*, 909 F.2d at 102. The Master found that "[t]he extent of postcompact well pumping in Colorado was not generally known until approximately 1968, and there is no substantial evidence that Kansas knew or should have known about the extent or effect of such well development before that time." Report at 169. Colorado takes exception to this finding.

The record in this case establishes that evidence of increased post-compact well development and pumping in Colorado was available long before 1968. The precise extent of such well development and pumping may not have been known prior to 1968, but the fact that the number of wells and the amount of pumping had increased substantially was public knowledge by 1956.

A January 1956 report prepared by the United States Geological Survey ("USGS") on ground water and the status of investigations in Colorado stated:

> Ground water has long been used in Colorado for domestic, industrial, and municipal supplies but until recently it was used only on a minor scale for irrigation. With the development of efficient pumps, engines, and motors and the availability of cheaper electricity and petroleum products for fuel, *the pumping of ground water for irrigation has grown by leaps and bounds since the early 1930's and is continuing to grow at an ever-accelerated pace. Data accumulated to date indicate that the number of irrigation wells in Colorado increased by about 150 percent between 1940 and 1953.* . . .

Colo. Exh. 95 at 4-5 (emphasis added).

With specific reference to ground water in the Arkansas River Basin, the January 1956 report stated:

> The alluvium and terrace deposits of the Arkansas Valley and its principal tributaries constitute an important aquifer in Colorado, but few data concerning the extent of development are available. On the basis of an inventory of irrigation wells made in the main stem of the valley in 1942 and of later detailed studies in

> some of the tributary valleys, *it is estimated that there are now 1,000 irrigation wells which discharge about 165,000 acre-feet of water annually for the irrigation (largely supplemental) of more than 100,000 acres of land.*

Colo. Exh. 95 at 7-8 (emphasis added). Duane D. Helton, one of Colorado's principal experts, Report at 145 note 57, relied on this report to show that development of wells in Colorado was common knowledge in 1956. RT Vol. 115 at 96-97.[32]

In December 1956, the Arkansas River Compact Administration "held considerable discussion concerning the activity of well drilling and its effect on conditions." Minutes of the Arkansas River Compact Administration

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[32] The January 1956 report was one of a series of reports published by the Colorado Water Conservation Board for use by the public and federal and state agencies as part of cooperative investigations with the USGS. Colo. Exh. 95 at 1; RT Vol. 81 at 87-91 (Helton) (describing history of cooperative studies with the USGS). The Colorado Water Conservation Board is a Colorado state agency with the duty to promote the conservation of the waters of the State of Colorado. Colo.Rev.Stat. §37-60-101, *et seq.* The director of the Colorado Water Conservation Board is one of the three Colorado representatives to the Compact Administration. Arkansas River Compact, Art. VIII-C. The USGS conducts investigations and measurement of water resources throughout the nation, often in cooperation with state agencies. Colo. Exh. 95 at 1-3, 17. *See* Arkansas River Compact, Art. VIII-G(2) (the director of the USGS is requested to collaborate with the Compact Administration and state officials in the systematic determination and correlation of data). Prior to the cooperative investigations in Colorado, the USGS had done investigations of ground water resources in Hamilton, Kearny, and Finney Counties in Kansas, which were published by the State Geological Survey of Kansas. Kan. Exhs. 447 and 448.

Annual Meeting (Dec. 11, 1956) at 15 (Jt. Exh. 19). Other reports published before 1968 also noted the conversion to more efficient pumps and substantially increased post-compact well pumping in the Arkansas River Valley in Colorado. Jt. Exh. 61 at 3 ("With the advent of better well-drilling methods, efficient pumps and the availability of electrical power, the development of ground-water [in the Arkansas River Valley] to supplement surface-water supplies increased rapidly, particularly in the drouth period of the early 1950's.") (published April, 1963); Jt. Exh. 136 at 37, 39-40 (USGS Water-Supply Paper on ground water resources of Prowers County, Colorado, published 1965); Jt. Exh. 137 at 45-46 (USGS Water-Supply Paper on ground water resources of Crowley County, Colorado, published 1965).

Moreover, officials in Kansas were aware of well development in Colorado before 1968. Colorado offered the deposition of Howard C. Corrigan, the former Kansas Water Commissioner of the Garden City Field Office who was employed by the Kansas Division of Water Resources for almost 40 years.[33] Colo. Exh. 21. Mr. Corrigan was asked in his deposition:

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[33] Mr. Corrigan was employed by the Kansas Division of Water Resources from 1947 to 1987. Colo. Exh. 21 at 5-8. He was assigned to the Garden City office in 1947 and was the only representative of the Kansas Division of Water Resources in Garden City until 1949. *Id.* at 6. He was the assistant water commissioner in Garden City from 1949 to 1963, and water commissioner of the Garden City field office from 1963 until his retirement in 1987. *Id.* at 6-7. As water commissioner, he had responsibility for the administration of all water within southwestern Kansas, including operations under the Arkansas River

Q: When did you become aware of well development in the State of Colorado?

A: Oh, shoot, back in the '50's.

Colo. Exh. 21 at 121. He was also asked:

Q: . . . Did you ever discuss well development in Colorado with any of the Colorado officials?

A: Oh, yes, that was discussed many times. . . .

* * *

Q: Did you discuss it in terms of the affect [sic] of well development on stream flows?

A: That has been discussed, yes.

Q: Do you recall when those discussions occurred?

A: I can't give you dates, no.

Colo. Exh. 21 at 122. In response to an interrogatory by Colorado, Mr. Corrigan had been listed by Kansas as a person with knowledge of unregulated development of post-compact alluvial wells in Colorado. The following question and answer occurred during the deposition:

Q. At the conclusion of Mr. Robbins' direct examination, . . . you were asked about an interrogatory question that Colorado had propounded to Kansas and you were asked, you

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Compact. *Id.* at 8-10. Kansas had planned to call him as a witness, RT Vol. 34 at 131; but he was hospitalized and was not called to testify. RT Vol. 39 at 6. Colorado then offered his deposition, which was admitted into evidence by the Master in a written order. Order Admitting Exhibits (Dec. 16, 1991).

were listed as one who had knowledge of the first factor which is the unregulated development of post-Compact alluvial wells as contributing to material depletions at the state line. And I understood you to say that you had no knowledge of any facts in that regard. . . . Would you care to clarify your testimony on that point?

A. Well, emphasizing the facts that I would have would be the various times of inspecting and going up into Colorado. I visually inspected the various development of wells and the wells that were drilled along the Arkansas River Basin which indirectly took water out of the river increasing the transit loss. . . . [E]ach and every year since the establishment of the Compact I have computed the transit losses. And a lot of it, I think, was due to a lot of this development of wells in the – along the Arkansas River Basin in the alluvial [sic].

Colo. Exh. 21 at 165-66. Colorado's counsel then followed up on this answer with the following questions:

Q. And with regard to the post-Compact well development that you inspected a number of times in Colorado, when did that occur?

A. That occurred all during the period of time from the '50's right on up to the – '87. I was up there at various times and there has been wells that have been developed just as I stated. . . .

Q. And you inspected those periodically all through the '50's, '60's and '70's?

A. It was noted during those periods of times, yes, at different times, and those wells were pumping.

Colo. Exh. 21 at 167.

The Master acknowledged that the depositions of Kansas' officials offered by Colorado showed that these men were aware of some well development in Colorado before 1968, and that some informal discussions had occurred within the Compact Administration. Report at 164.[34] However, he states that the evidence is "sketchy" and "does not demonstrate that these officials were aware of the number of wells, the extent of Colorado's pumping, or the impact or even potential impact of pumping on usable Stateline flows." *Id.*

The Master misconceives the issue. The issue is not whether these men had actual knowledge of the number of wells in Colorado, the precise extent of pumping in Colorado, or the impact or potential impact of pumping on usable Stateline flows. The issue is whether Kansas knew or, in the exercise of reasonable diligence, should have known of facts giving rise to its claim before 1968. *Aukerman*, 960 F.2d at 1032; *White v. Daniel*, 909 F.2d at

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[34] In fact, formal discussion of well drilling and its effect on conditions did occur at the annual meeting of the Compact Administration in 1956. Minutes of Arkansas River Compact Administration Annual Meeting (Dec. 11, 1965) at 15 (Jt. Exh. 19). Colorado also offered the deposition of Carl Bentrup, a farmer from Deerfield, Kansas, who was a Kansas representative to the Compact Administration from 1957 to 1988. Colo. Exh. 17 at 5-6, 34. Mr. Bentrup did not have knowledge of well development in Colorado in the 1950s, but testified that he remembered wells being drilled in Colorado in the 1960s. *Id.* at 46-47. He testified: "On tours you gradually noticed more wells." *Id.* at 47. "And," he said, "we were beginning to get quite concerned about wells in Colorado and I naturally was looking for them, noticing them on what tours we were taking." *Id.* Mr. Bentrup's deposition was admitted into evidence by the Master. Order Admitting Exhibits (Dec. 16, 1991).

102. Colorado offered the deposition of Mr. Corrigan to show that at least one key Kansas official knew about well development in Colorado in the 1950s, had made inspections in Colorado from the 1950s right up to 1987, had made computations of transit losses each year since the Compact was adopted, and believed that wells indirectly took water from the river increasing the transit losses and that a lot of the transit losses were due to wells.

Colorado's evidence was uncontroverted. Kansas did not call *any* witnesses to testify that Kansas was not aware of increased post-compact well development and pumping in Colorado in the 1950s or early 1960s or its potential impact on Stateline flows. In fact, Edward DeKeyser, a witness called by Kansas who was the superintendent of the Amazon Ditch in Kansas from 1939 to 1981, RT Vol. 33 at 65-67, testified that in 1956 his ditch company board became very concerned about the decline in Stateline flows and instructed him to go to Colorado to investigate, and that he made an investigation of well development in Colorado in 1956 from property tax records. *Id.* at 82-84.

Furthermore, Stateline flows declined substantially from 1952-56 and again in the early 1960s. Report at 142-43. While these declines may have been due in large part to drought and implementation of the Compact, the declines were sufficient to call for inquiry and investigation by Kansas, and in fact did result in an investigation by Mr. DeKeyser at the direction of his ditch company board in 1956. Moreover, there was "considerable discussion concerning the activity of well drilling and its effect

on conditions" by the Compact Administration at its annual meeting in December 1956. Minutes of the Arkansas River Compact Administration Annual Meeting (Dec. 11, 1956) at 15 (Jt. Exh. 19).

Laches will not be imputed to one who has been justifiably ignorant of facts which create his right or cause of action. *Studiengesellschaft Kohle*, 616 F.2d at 1326; *Potash*, 213 F.2d at 155. But ignorance will not of itself excuse delay. *Id.* "The party must be diligent and make such inquiry and investigation as the circumstances reasonably suggest, and the means of knowledge are generally equivalent to actual knowledge." *Potash*, 213 F.2d at 155; *Benedict v. New York*, 250 U.S. at 328; *see also City of New Albany v. Burke*, 78 U.S. (11 Wall.) at 107 (possession of the means of knowledge of fraud is in equity tantamount to knowledge itself).

Applying these principles to this case, it is clear that whether or not Kansas actually knew of the number of wells, the precise extent of pumping in Colorado, or the impact or potential impact of post-compact well pumping in Colorado on usable Stateline flows prior to 1968, it had sufficient knowledge, or the means of knowledge, to call for an inquiry and an investigation of post-compact well pumping in Colorado by 1956. The report published in January 1956, the declines in Stateline flows from 1952-56, the inspections made by Mr. Corrigan, the investigation undertaken by Mr. DeKeyser in 1956, and the discussion at the Compact Administration's annual meeting in 1956 demonstrate that sufficient information was available to Kansas to call for an inquiry and an investigation of post-compact well pumping at that time. Further, Colorado and the USGS continued to publish information about

well development in the Arkansas River Valley in Colorado from 1956 to 1968. Jt. Exhs. 61, 67-69, 136, 137. Several of these reports noted the conversion to more efficient pumps and increased well development and pumping in Colorado. Jt. Exh. 61 at 3; Jt. Exh. 136 at 37, 39; Jt. Exh. 137 at 45.

The Master states, however, that none of the reports relating to well pumping in Colorado deals with the issue of impact on *usable* Stateline flow. Report at 161. Once again, this is not the relevant inquiry. The issue is whether Kansas had sufficient information to investigate and determine if a Compact violation existed. *Potash*, 213 F.2d at 155; *Pearson v. Central Ill. Light Co.*, 210 F.2d 352, 356-57 (7th Cir. 1954); *Naxon Telesign Corp. v. Bunker Ramo Corp.*, 517 F. Supp. 804, 808 n. 3 (N.D.Ill. 1981), *aff'd, in part*, 686 F.2d 1258 (1982) ("Even if Naxon had been 'unsure' of the infringement, it had a duty to promptly investigate and determine if infringement existed.").

The *potential* impact of an increase in well pumping in Colorado was known by officials in Kansas prior to the Compact. Kan. Exh. 205A at 1-2 (letter dated July 13, 1940, from George S. Knapp to W.E. Stanley describing how Colorado could increase consumption without increasing irrigated acreage by increasing well pumping); *see also* Kan. Exh. 448 at 39-69, 78-80 (1943 report prepared by the USGS on ground water resources of Hamilton and Kearny Counties, Kansas, discussing principles governing the occurrence and movement of ground water and the effect of pumping on water levels and stream flow).[35]

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[35] Moreover, Colorado was prejudiced in proving that Kansas had actual knowledge of increases in post-compact well

Thus, by 1956, Kansas had sufficient information about increased well pumping in Colorado and its potential impact on usable Stateline flows to call for an investigation to determine if a Compact violation existed. Yet Kansas did nothing until 1983 when it hired Simons, Li to make an investigation of declining Stateline flows, and made no request for an investigation by the Compact Administration until 1985. Kansas delayed 29 years (1956-1985) in making a request for an investigation by the Compact Administration after it knew or, in the exercise of reasonable diligence, should have known of facts giving rise to its claim, a delay longer than its 21-year delay in *Colorado v. Kansas*, 320 U.S. at 394.

The Master was unwilling to find that Kansas delayed unreasonably in asserting its rights because neither state seemed to be aware that well pumping in Colorado depleted usable Stateline flows. He states:

> Colorado also accuses Kansas of sleeping on its rights, saying that is the issue. . . . This latter argument, however, seems to undercut Colorado's reliance on its own good faith. At least,

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pumping in Colorado by 1956 and the potential impact of such increases on usable Stateline flow because key witnesses from that period, including Robert V. Smrha, William E. Leavitt, and Roland H. Tate, had died. Report at 158-59. Smrha was the Kansas Chief Engineer from 1951 to 1972, the chief state official charged with the administration of water rights in Kansas. *See* Arkansas River Compact, Art. VIII-C. As the Kansas Chief Engineer, Smrha was a Kansas representative to the Compact Administration from 1951 to 1972. *See* Annual Reports of the Arkansas River Compact Administration for the years 1951 to 1972 (Jt. Exh. 18). Leavitt and Tate were Kansas representatives to the Compact Administration from 1949 to 1957. *Id.*

> Colorado's argument requires that Kansas recognize a potential compact violation while Colorado is excused.

Report at 165.

The Master confuses two distinct issues. Colorado never suggested that there was no evidence of a potential Compact violation. However, several Colorado witnesses testified that, in their opinion, pumping by wells upstream from Colorado ditches reduced diversions by Colorado ditches, not Stateline flows, or that depletions caused by well pumping were offset by transmountain return flows. RT Vol. 66 at 44-47 (Miles); RT Vol. 78 at 61-62, 85-86 (Danielson); RT Vol. 84 at 51-52, Vol. 115 at 62-63 (Helton).[36] Dr. Jeris A. Danielson, the Colorado State Engineer from 1979-1992, testified that his predecessor as State Engineer, C.J. Kuiper, had continued to issue well permits near the Stateline in the 1970s because of his belief that there was still a substantial amount of unused water passing Garden City and because Kansas was allowing wells to be drilled in Kansas. RT Vol. 76 at 112-15. Thus, Colorado argued that its officials believed in good faith that post-compact well pumping did not violate the Compact. *See Aukerman*, 960 F.2d at 1033 (a good-faith belief in the merits of a defense may tilt matters in the defendant's favor). However, the fact that

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[36] The Master agrees that transmountain return flows offset some depletions in Colorado: "The compact does not cover transmountain imports, and Kansas has acknowledged that it makes no claim to such water. However, the return flows from such imports do add to the Arkansas River supply and do act to offset depletions caused by use in Colorado." Report at 257.

Colorado officials believed in good faith that post-compact well pumping did not violate the Compact does not in any way detract from the fact that for 29 years Kansas knew or, in the exercise of reasonable diligence, should have known of facts giving rise to its claim.[37]

2. Kansas Has No Valid Excuse for its Lengthy Delay

Once it is established that Kansas had delayed for a lengthy period of time in making a complaint about post-compact well pumping in Colorado, the inquiry shifts to whether Kansas had a justifiable excuse for its delay. Although there was no specific evidence to explain why Kansas did not complain sooner, Report at 170, the Master speculated that:

> . . . Kansas may well have been relying upon the slowly developing regulatory system in Colorado for protection. This program was evolving all through the 1970s, . . . It is true that the implementation of this requirement has proved lacking, but that result could not have been known at the outset.

Id. Having posited that Kansas was relying upon Colorado's efforts to regulate pumping, the Master ruled that Kansas' reliance on Colorado was a justifiable excuse for not making a complaint:

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[37] Moreover, to the extent the Master focused on Colorado's actions rather than Kansas' delay, he distorted the basic concept of laches. *Aukerman*, 960 F.2d at 1031-32. Laches focuses on the dilatory conduct of the plaintiff and the prejudice which the plaintiff's delay has caused. *Id.*

> I think that Kansas had a right to rely, at least initially, upon the Colorado efforts to regulate pumping, and the law should not penalize a state under those circumstances. . . . Moreover, equitable defenses should not be applied in ways to encourage or force early litigation between states, particularly when a state is implementing efforts to address the problem.

Report at 170.

The reasons suggested by the Master are not justifiable excuses for Kansas' lengthy delay in making a complaint. First, there is no evidence in the record that Kansas was relying upon "the slowly developing regulatory system in Colorado for protection" or that Colorado's actions had anything to do with Kansas' decision not to complain. *See Potash*, 213 F.2d at 159. Kansas knew or had reason to know of increased well development and pumping in Colorado by at least 1968 or, if Colorado is correct, much earlier. For at least 16 years after it knew or had reason to know of facts giving rise to its claim, Kansas did not request an investigation by the Compact Administration, it made no complaint to appropriate Colorado officials, and it did not state that it was forebearing from making a complaint in reliance on actions being taken by Colorado. Nothing put Colorado on notice that Kansas was concerned about the possible effects of well pumping or that Colorado was at risk of being sued for a Compact violation.

Second, Colorado was implementing efforts to address the impacts of well pumping on senior surface rights in Colorado, not Stateline flows. Report at 133,

162.[38] If Kansas was relying on Colorado's efforts to address a *Compact* violation, Kansas should have at least informed Colorado of its intent to pursue a claim in the event actions by Colorado were unsuccessful. *Cf. Studiengesellschaft Kohle*, 616 F.2d at 1328. This is not a case where Kansas had complained and Colorado was implementing measures to address the problem. Kansas simply did nothing until 1984, when it furnished Colorado with a copy of the Simons, Li report.

Moreover, Kansas could have investigated a possible Compact violation without bringing litigation. The Arkansas River Compact created an interstate agency which had authority to investigate violations of the Compact, Arkansas River Compact, Art. VIII-A, VIII-H, and Kansas was represented on the Compact Administration by the Kansas Chief Engineer, the chief state official charged with administration of water rights, and by two local water right owners. *Id.*, Art. VIII-C. Further, during the lengthy period that Kansas delayed in making a complaint, it made no effort to have the Compact Administration or the USGS collect or preserve evidence that would be needed to determine its claim, including power records, power coefficients, tributary inflows, and flows at Garden City. *See* Arkansas River Compact, Art. VIII-

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[38] While the Colorado State Engineer believed that well pumping had reduced flows of the Arkansas River in Colorado available to senior Colorado ditches, he also believed that there was a substantial amount of water passing Garden City unused. RT Vol. 76 at 112-15 (Danielson). Thus, the Colorado State Engineer did not adopt regulations to protect Stateline flows. *Id.* at 84-86 (Danielson). *See* Report at 161-62.

G(1), VIII-G(2). Under the circumstances, reliance on Colorado's efforts to regulate pumping for protection is not a justifiable excuse for Kansas' delay.

The Master appeared to be unwilling to find that Kansas' delay was inexcusable because in *Texas v. New Mexico*, 482 U.S. 124 (1987), the Court held that New Mexico could not escape liability for past failures to perform its duties under the Compact based on good-faith differences about the scope of undertakings under the Compact. Report at 165-66. In that case, however, Texas brought its concerns to the attention of the Pecos River Compact Commission in 1957. *Texas v. New Mexico*, 462 U.S. 554, 560-61 (1983). Thereafter, Texas continued to try to resolve its concerns through the Compact Commission until, in 1974, it finally brought suit against New Mexico. *Id.* at 561-62. Moreover, contrary to the Master's belief, Report at 167, New Mexico did raise the defense of laches, which was rejected by Special Master Jean S. Breitenstein:

> Texas had asserted its claims in the administrative forum for many years before bringing this suit. The continued efforts of Texas to have the Commission adopt its position does not preclude it from bringing this action. Otherwise, Supreme Court litigation would replace negotiation. The Master rejects the defense of laches.

Report of Special Master on His Decision and Supplemental Decision Regarding the Affirmative Defenses of New Mexico to the Complaint of Texas, *Texas v. New Mexico*, No. 65, Original (Oct. Term 1975) at 13 (May 6, 1979).

In this case, Kansas had not asserted its claims in the administrative forum for many years before bringing this

suit. *Cf. Gull Airborne Instruments, Inc. v. Weinberger*, 694 F.2d 838, 844 n. 8 (D.C. Cir. 1982) (plaintiff's many attempts to receive administrative relief served to put the government on notice that plaintiff was not sleeping on its rights). Charging Kansas with unreasonable delay in this case would not "encourage or force early litigation between states." Here, Kansas had available a means to investigate a possible violation of the Compact through an investigation by the Compact Administration. Arkansas River Compact, Art. VIII-H. The Compact also provides that the Compact Administration may refer matters for arbitration. *Id.*, Art. VIII-D. Thus, Kansas had means available, short of litigation, to make a complaint, but failed to make use of those means. Although equitable defenses should not be applied to encourage or force early litigation between states, it is sound public policy to encourage a state to give early notice of and an opportunity to remedy possible compact violations to a sister state, rather than sitting back silently while damages accrue.

The Master also suggested that Kansas' delay should be excused, at least for some period of time, because determining what flows are usable, and depletions to usable Stateline flows, in contrast to depletions to the total Stateline flows, is not simple. Report at 161, 162-63. While Kansas may have been entitled to a reasonable period of time to conduct an investigation into the basis for its claim, that excuse does not justify Kansas' lengthy delay in this case. For example, the 1983-84 investigation conducted by Simons, Li & Associates, Inc., for the State of Kansas was completed in five months. Jt. Exh. 88 at 1.1.

Simons, Li did not hesitate to make a preliminary assessment of what flows were usable or to make a preliminary estimate of depletions to usable flows from post-compact well pumping in Colorado. *Id.* at 5.2 to 5.5. Thus, the difficulty in determining what flows are usable, and depletions to usable Stateline flows, does not justify Kansas' lengthy delay in this case. *See Stone v. Williams*, 873 F.2d at 625 ("But these reasons for delay cannot last forever for the purposes of laches. A point arrives when a plaintiff must either assert her rights or lose them.").

3. Colorado Was Prejudiced by Kansas' Unexcused Delay

The final inquiry in the laches analysis is whether Colorado was prejudiced by Kansas' delay. Courts have recognized a variety of factors which constitute prejudice to the defendant from the plaintiff's delay.[39]

Evidentiary or "defense" prejudice may arise due to the loss of evidence, the death of witnesses, or the fading memories of other witnesses, thereby undermining the court's ability to determine the facts. *Brown v. County of Buena Vista*, 95 U.S. at 161; *Aukerman*, 960 F.2d at 1033; *Stone v. Williams*, 873 F.2d at 625-26; *Studiengesellschaft*

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[39] Federal Courts have generally applied a sliding scale on the issue of prejudice. *E.g., White v. Daniel*, 909 F.2d at 102; *Goodman v. McDonnell Douglas Corp.*, 606 F.2d at 807. The shorter the delay, the greater the prejudice the defendant must show and vice versa. *Id.* Obviously, the longer the delay, the greater the likelihood that witnesses have died, memories have faded, and evidence has been lost or obscured, which is certainly true in this case.

Kohle, 616 F.2d at 1326-27; *Goodman v. McDonnell Douglas Corp.*, 606 F.2d at 808 n. 17. *See Indiana v. Kentucky*, 136 U.S. 479, 511 (1890), *quoting Rhode Island v. Massachusetts*, 45 U.S. (4 How.) 591, 639 (1846).

Economic prejudice may arise where the defendant will suffer the loss of monetary investments or incur damages which likely would have been prevented by earlier suit. *Aukerman*, 960 F.2d at 1033. In other cases prejudice may arise because a defendant has changed its position in a manner that would not have occurred but for the plaintiff's delay. *Gull Airborne Instruments, Inc. v. Weinberger*, 694 F.2d at 844.

The Master acknowledged that there were problems with missing data in trying to reconstruct pumping in Colorado. Report at 157, 189, 202. Nevertheless, he concluded that Colorado had not suffered prejudice by Kansas' delay because data from the pre-compact or early post-compact years "was simply not being collected at that time." *Id.* at 157. He states: "The lack of data suggests that neither state could be expected to have been aware of the effect of pumping." *Id.* Further, he found that the comprehensive evaluation of the hydrology of the Arkansas River Valley in Colorado by the USGS in 1963-68 "used and collected all the data then reasonably available." *Id.* at 158. He states: "If Colorado has suffered any prejudice because of data missing prior to 1963, it is not because Kansas failed to complain about pumping, but simply because the data were not kept." *Id.* Colorado takes exception to these findings.

a. Evidentiary Prejudice

First, Colorado established that electric power records for the period 1940-63 were missing. Colo. Exh. 165*, Table 2.2; RT Vol. 69 at 107-08 (Slattery). The fact that data concerning pumping was not being collected does not mean that electric power records could not have been obtained if Kansas had made a timely complaint. The USGS did collect some power records during the 1963-68 investigation, but there is simply no way to know if the USGS "used and collected all the data then reasonably available" to estimate pumping for the period 1940-63. The electric power records or other data used to make those estimates were not published by the USGS, the data collected during the study to make those estimates was not preserved, and the man who made the USGS estimates for those years, R. Theodore Hurr, had died and was not available to explain the basis on which he had made those estimates. Report at 187; RT Vol. 71 at 51-53 (Slattery); RT Vol. 126 at 58 (Book); RT Vol. 130 at 48-49 (Simpson). In fact, there is no evidence that the USGS pumping estimates for the 1940s were based on power records at all or that the USGS collected any power records for that period. RT Vol. 130 at 49, 51-52 (Simpson).[40]

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[40] To estimate pumping in the CENTEL (Southern Colorado Power Company) service area prior to 1959 and in the Southeast Colorado Power Association (SECPA) service area prior to 1953, Kansas relied upon a tabulation of power company records prepared by the USGS. Colo. Exh. 660 at 4, 9. This tabulation went back to 1948 for the Pueblo Office of the Southern Colorado Power Company and for the Southeast Colorado Power Association; but, it is not clear when the USGS tabulation was

The main focus of the USGS investigation was to inventory wells, map the valley-fill deposits, measure water levels, and read power meters to develop detailed estimates of pumping for the period 1964-68. Jt. Exh. 66 at 4 ("Since 1964, most of the electric and gas meters on irrigation wells have been read during the spring and fall measurements; these readings provide the major source of data to compute ground-water withdrawal."). There is no indication in the 1970 USGS report that the estimates of ground water withdrawals before 1964 were significant for the purposes of that investigation. *See* RT Vol. 130 at 48-49 (Simpson). Nor is there any report on how those estimates were made. RT Vol. 71 at 51-52 (Slattery). Had Kansas complained in a timely manner in 1956, Colorado could have begun the cooperative investigation with the USGS before 1963 and could have attempted to collect missing power data for the years 1940-63. Further, had Kansas complained in 1968, the data used by the USGS to estimate pumping for the years 1940-63 would have been available, and Mr. Hurr would have been available to explain the data and assumptions he had used to make those estimates. Thus, the Master is simply wrong in finding that Colorado did not suffer prejudice because Kansas failed to complain.

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prepared. Colorado used identical power data for these two utilities to make estimates for those years; but, Colorado also obtained power data from Colorado State University, which had collected power data from the Southern Colorado Power Company that went back to 1932 and from the SECPA that went back to 1946. *See infra* note 53. Moreover, both Colorado and Kansas obtained power records from other utilities.

The Master acknowledged that electric power records were missing for the period 1940-60, but suggested that the prejudice to Colorado was not substantial because the missing records could be estimated by regression analyses. Report at 157. That was true to an extent; but, the Master concluded that the regression analyses which Colorado's experts made to estimate missing electric power records for the 1940-45 period were not reliable because they were based on a single set of data for the Pueblo Office of the Southern Colorado Power Company. *Id.* at 189-90. Further, the Master rejected Colorado's estimates for 1946-49, which included power records that were estimated by regression analyses, in part because the power records used to make those estimates were incomplete and might be inaccurate. *Id.* at 188-89, 199-200. Thus, it is totally inconsistent for the Master to say that the prejudice to Colorado from missing electric power records was not substantial when he rejected Colorado's estimates of pumping for the 1940s because there was insufficient data to support them. *Id.* This was not an insignificant issue. In the Report, he states that the amount of the pre-compact pumping allowance was the largest quantitative issue in the case. *Id.* at 182. Thus, Colorado suffered substantial prejudice from Kansas' delay.[41]

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[41] The Master suggests that there is some merit to Kansas' contention that the Colorado experts did not make any serious complaint about the lack of pre-1965 data. Report at 157. In fact, Mr. Slattery testified that the Colorado estimates before 1960 were more uncertain than the estimates after 1960 because of the lack of data. RT Vol. 69 at 93-94. Moreover, while Mr. Helton testified that Mr. Slattery's estimates of pre-compact pumping

In addition to missing electric power records, there was very little information available on pumping by wells powered by non-electric sources, except for the USGS investigation covering the years 1964-68. Report at 211. There is simply no information on what data the USGS collected, if any, to estimate pumping by non-electric powered wells before 1964, and Mr. Hurr had died and was unavailable to explain the assumptions he had made to make his estimates.

The Master also states that it is highly speculative to assume that Colorado would have been able to collect additional data if Kansas had complained sooner. Report at 158. This finding is totally unsupported by the record. First, the USGS investigation during the period 1963-68 was a cooperative investigation with Colorado agencies, Jt. Exh. 66 at 1, which was undertaken without any complaint by Kansas. Had Kansas complained in 1956, that cooperative investigation could have begun earlier. Second, very complete power records were available from 1975 forward, Colo. Exh. 660 at 3-4; RT Vols. 22 at 78-79; 126 at 10-11 (Book), which demonstrates, as one would

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were reasonable, RT Vol. 115 at 58, he also testified that Kansas' estimates of pre-compact pumping were "grossly unfair" to Colorado and not at all representative of what a reasonable level of use would be from those wells. *Id.* The differences between the Colorado and the Kansas pre-compact estimates were almost entirely due to lack of data; and, the Master rejected Colorado's estimates because of lack of data. Thus, while the Colorado experts may not have made a serious complaint about the lack of pre-1965 data per se, they made it clear that the estimates before 1960 were more uncertain and that the uncertainty was due to lack of data.

expect, that power records were much more complete the closer one got to the date of Kansas' complaint.[42]

In addition, had Kansas complained in 1956, farmers or other knowledgeable persons could have been called to testify about non-electric power usage and pumping in the 1940s and 1950s, as Mr. Miles and Mr. Longenbaugh were able to do for the 1970s. Report at 213-14. Likewise, information on conversion from centrifugal pumps and the efficiencies of centrifugal pumps used in the 1940s and 1950s could have been obtained.

Further, there was missing data to estimate pumping after 1968, when the USGS study ended. Specifically, there was only limited data on power conversion coefficients and well-by-well pumping. Report at 215-18; RT Vol. 22 at 50-51 (Book). Had Kansas complained at that time, Colorado could have continued the reading of power meters to estimate pumping and made additional measurements of power coefficients.

The Master rejects this argument and states that he doubts that complaints by Kansas realistically would have made any difference in Colorado's data collection system. Report at 148. He based this conclusion on the fact that "nothing substantial was done" in response to recommendations in the Wheeler Report in 1968 to obtain accurate and continuous discharge records of major tributary inflow and to install meters on wells. *Id.* This statement is inaccurate and unfair. The Purgatoire River and the Apishipa River have been gaged throughout the post-

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[42] Even these records for the most part are not well-by-well power records. RT Vol. 22 at 50-51 (Book).

compact period. Colo. Exhs. 835 and 836. Streamflow gages were established or reestablished on Fountain Creek at Pueblo, the St. Charles River, the Huerfano River, and Big Sandy Creek after 1968. Colo. Exh. 2, Table 2.2.1 at 2-19 (Fountain Creek at Pueblo, 1971-1985); at 2-20 (St. Charles near Vineland, CO, 1968-1974; St. Charles at Vineland, CO, 1978-1985); at 2-21 (Huerfano River near Boone, 1979-85); at 2-25 (Big Sandy Creek near Lamar, 1968-1982). These are the *major* tributaries below Pueblo and streamflow gages were installed on these, as well as other tributaries. *Id.*

Admittedly, the Colorado State Engineer did not order well owners to install meters on wells, but Dr. Danielson and Mr. Simpson explained why they felt that ordering farmers to install meters in wells was not feasible. Report at 113 note 43. While Colorado could have continued the cooperative investigation with the USGS to read power meters, that study was very expensive, RT Vol. 129 at 28 (Major), and there were no complaints by Kansas to justify continuation of that program.

Moreover, missing evidence to estimate pumping was not the only evidentiary prejudice suffered by Colorado from Kansas' delay. Important witnesses who could have established Kansas' knowledge of increased well pumping and post-compact well development in Colorado in 1956 had died, including William E. Leavitt, Roland H. Tate, and Robert V. Smrha. Report at 158-59.[43] The Master states that the testimony of these men would

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[43] Tate died in 1964. Leavitt died in 1967. Smrha died sometime after he retired in 1972. Report at 159.

not have been useful because the records of the Compact Administration are completely devoid of any references to well pumping in Colorado during this time period. *Id.* at 159. In fact, there was "considerable discussion concerning well drilling and its effects on conditions" at the annual meeting of the Compact Administration in December, 1956. Thus, their testimony would have been highly useful to establish their knowledge of post-compact well pumping in Colorado and the reasons Kansas did not make a complaint or request an investigation at that time.

In addition, Colorado established that the streamflow gage at Garden City had been converted to a gage to record flood flows in 1970. Report at 300. The flow at Garden City was needed to do an analysis of flows that had passed Garden City unused. *Id.* at 296. It is unlikely that Colorado would have agreed to the conversion of the Garden City gage had Kansas given any indication that Colorado might be sued for a Compact violation at that time.[44] In addition, had Kansas complained in 1968, it is unlikely that the Colorado State Engineer would have continued to issue well permits after that date. *See* RT Vol. 76 at 109-15 (Danielson).

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[44] The gaging station at Garden City was discontinued by mutual agreement of the States. Twenty-Second Annual Report of the Arkansas River Compact Administration at 7 (1970) (Jt. Exh. 18).

b. Economic Prejudice

With regard to economic prejudice, the Master found that Colorado had not been prejudiced by Kansas' delay because once farmers in Colorado, relying upon Colorado law, had made investments to replace pumps and construct wells, the passage of time would not create prejudice. Report at 157. On the contrary, he concluded that delay by Colorado or Kansas in bringing about well regulation permitted the benefits of those wells to be increasingly enjoyed and such investments amortized. *Id.* This analysis confuses benefits of wells to well owners with prejudice to Colorado.[45] While well owners may have enjoyed benefits from post-compact well pumping, the Special Master recommends that Colorado should now pay damages for depletions to usable Stateline flows since 1950 when Kansas made no complaint about such pumping for 29 years. To the extent well owners in Colorado made substantial investments during that period and damages increased while Kansas delayed in complaining about post-compact well development, Colorado was prejudiced by Kansas' delay. *See Colorado v. Kansas*, 320 U.S. at 394; *Continental Coatings Corp. v. Metco, Inc.*, 464 F.2d 1375, 1378 (7th Cir. 1972).

Thus, Colorado demonstrated that important evidence was missing, that important witnesses had died,

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[45] It also ignores the fact that, as Mr. Miles testified, farmers made changes in their operations to incorporate the use of wells, which would make it difficult to convert back to the use of surface water only. RT Vol. 66 at 44-46. *See* Report at 217 (noting Miles' testimony that many systems changed over to underground pipelines).

that there were actions Colorado could have taken to obtain evidence had Kansas complained earlier, and that Colorado had changed its position because Kansas had not complained. Moreover, well owners in Colorado made substantial investments to replace centrifugal pumps, to construct wells, and to change their methods of operation while Kansas unexcusably delayed in making its claim. Report at 149, 217. This evidence was certainly sufficient to establish prejudice.

In summary, the evidence clearly and convincingly shows that 1) Kansas delayed for a lengthy period of time – at least 16 years, or 29 years if Colorado is correct – in making its well claim; 2) there was no valid excuse for Kansas' delay; and 3) Colorado was prejudiced by Kansas' unexcused delay. Thus, Colorado established the basis for its defense of laches.

4. Laches Should Bar a Claim for Damages until Kansas Made a Request for an Investigation in 1985

Application of laches to Kansas' well claim would not affect the prospective enforceability of the Compact, but Kansas' unreasonable and unexcused delay should bar a claim for damages prior to March 1985, when Kansas asked the Compact Administration to conduct an investigation. *Aukerman*, 960 F.2d at 1031; *A.C. Aukerman v. Miller Formless Co.*, 693 F.2d 687, 699 (7th Cir. 1982); *Univ. of Pittsburgh v. Champion Prod., Inc.*, 686 F.2d 1040, 1044 (3d.Cir.), *cert. denied*, 459 U.S. 1087 (1982). Moreover, application of laches would also eliminate the difficult

problems, largely caused by Kansas' delay, in trying to reconstruct pumping back to 1950.

II. ARTICLE IV-D OF THE ARKANSAS RIVER COMPACT DOES NOT LIMIT PRE-COMPACT WELLS IN COLORADO TO PUMPING 15,000 ACRE-FEET PER YEAR AFTER THE COMPACT BECAME EFFECTIVE

The most significant factual issue in this case was the amount pre-compact wells in Colorado were entitled to pump after the Compact became effective. As the Special Master states:

> Both Kansas and Colorado acknowledge that some wells were in existence during the precompact years, and that pumping of groundwater did occur. Both states also agree that a certain amount of pumping should thus be allowable under the compact. However, the states are in major disagreement over the extent of this allowance. In fact, in terms of potential impact on Stateline flows, the amount of so-called "precompact" pumping is the largest quantitative issue in the case.

Report at 182.

Kansas estimated that ground water pumping in Colorado between Pueblo and the Stateline was 11,000 acre-feet in 1948. Report at 182. Kansas contended that this was the amount of pumping thus "grandfathered" under

the Compact and all that pre-compact wells were allowed to pump in post-compact years. *Id.*[46]

In contrast, Colorado assumed that wells with pre-compact dates of appropriation were entitled to pump the amounts they had pumped under Colorado law, which varied from year-to-year, but averaged 49,275 acre-feet during the period 1950-1985. Report at 183.

The Master rejected both Kansas and Colorado's assumptions about the amount that well owners with pre-compact wells were entitled to pump after the Compact became effective, and instead recommends that pre-compact wells should be limited to pumping the highest amount pumped during the years the Compact was negotiated, which he found to be 15,000 acre-feet per year. Report at 186-88, 200. One reason he rejected Colorado's theory of entitlement was that many well owners in Colorado had replaced centrifugal pumps with more efficient turbine pumps in the early 1950s, which allowed them to pump more water than they had pumped before the Compact became effective. *Id.* at 189. The Master concluded that the increased pumping was "improved or prolonged functioning of existing works" under Article IV-D of the Compact and, therefore, a future beneficial development subject to the limitations of Article IV-D of

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[46] Kansas made no estimates of ground water pumping in Colorado before 1948. RT Vol. 126 at 55-56 (Book). Moreover, Kansas' estimate for 1948 was based on incomplete power records and assumed that pumping by non-electric wells was the same percentage in 1948 as in 1964 when the USGS did an extensive inventory of wells in Colorado. *See infra* notes 48 and 52.

the Compact. *Id.* at 194. Colorado takes exception to this ruling.

A. PRE-COMPACT WELLS ARE NOT LIMITED TO PUMPING THE HIGHEST AMOUNT PUMPED IN THE YEARS DURING WHICH THE COMPACT WAS NEGOTIATED

In interpreting Article IV-D of the Compact, the Master relied on what he believed the Compact negotiators had intended and ignored the subsequent practice of the parties to the Compact.[47] For at least 36 years after the

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[47] The Master generally relied for his interpretation of the Compact on the Kansas historian, Dr. Douglas Littlefield, who prepared a two-volume history of the Arkansas River Compact and testified at length at trial. Report at 71-73. In his report, Dr. Littlefield repeatedly asserted the thesis that the Compact was intended to preserve the status quo in relation to existing diversions in Kansas and Colorado. *E.g.*, Kan. Exh. 129 at 6-8, 263, 296-97, 349-50, 380, 387, 392, 440, 459-60. Colorado objected to portions of Dr. Littlefield's testimony and his report on the grounds that they contained inadmissible legal conclusions about the meaning of the Compact and the intent of the Compact Commissioners, and the Master did grant Colorado's motion to strike portions of the testimony and report. Report at 73; Order (Nov. 13, 1993). However, the Master generally adopted Dr. Littlefield's thesis as his own. Report at 73, 89-90.

Colorado has several objections to Dr. Littlefield and the Master's interpretation of the Compact. First, Dr. Littlefield developed his thesis in large part on the basis of the "broader historical context within which the need for a compact arose." Kan. Exh. 129 at 10-11. Dr. Littlefield's approach reflects the difference between methods used by historians and methods used by Courts to interpret a compact. *See* Kan. Exh. 129 at 11-15. For example, during cross-examination it was brought out that Dr. Littlefield had not relied on anything after the

Compact became effective, Kansas made no objection to the replacement of centrifugal pumps with turbine pumps or increased pumping by pre-compact wells which resulted from improved pumps, drier climatic conditions, or other factors. Not once before this litigation did Kansas suggest that pumping by pre-compact wells in Colorado was limited to the amount pumped during the pre-compact period. Nor did Kansas prevent replacement of centrifugal pumps by turbine pumps or limit pumping by pre-compact wells in Kansas to the amount pumped during the pre-compact period. Jt. Exh. 105 at 40; Report at 226. It is not proper to ignore the subsequent

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Compact was signed, including General Kramer's report to Congress, the hearings held by Congress, or the reports by the Commissioners. RT Vol. 9 at 114-15. Further, he had relied "to a substantial degree" on unedited, uncertified transcripts of the Compact negotiations that were discovered in General Kramer's files rather than the official record of the meetings which the Commissioners had prepared and approved. *Id.* at 115, 120-24, 126-30. *See also* Kan. Exh. 129 at 225, note 274. The Master adopted Dr. Littlefield's approach in interpreting the Compact, Report at 71-90, relying heavily on "the rich history of controversy over the river, and early efforts to apportion its waters between the two states," Report at 71, to derive certain principles which he then used to interpret the Compact. *Id.* at 89-90. He also relied on the unedited, uncertified transcripts of the Compact negotiations (Jt. Exh. 4). *Id.* at 92, 93, 96, 99, 100, 103. The result is that instead of determining the meaning of the Compact from the language of the Compact, the official record prepared by the Commissioners, the report to Congress by General Kramer, the reports by Commissioners, and the subsequent practice of the parties, Dr. Littlefield and the Master tried to divine what they thought the Commissioners had intended from the background leading to the adoption of the Compact.

practice of the parties in interpreting an interstate compact. *See* Restatement (Third) of the Foreign Relations Law of the United States § 325(2) (1987) (subsequent practice is relevant to the interpretation of international agreements); Restatement (Second) of Contract § 202 and comment g (1981) ("The parties to an agreement know best what they meant, and their action under it is often the strongest evidence of their meaning.").

Furthermore, Article VI-A(2) of the Compact provides:

> Except as otherwise provided, nothing in this Compact shall be construed as supplanting the administration by Colorado of the rights of appropriators of waters of the Arkansas River in said State as decreed to said appropriators by the courts of Colorado, nor as interfering with the distribution among said appropriators by Colorado, nor as curtailing the diversion and use for irrigation and other beneficial purposes in Colorado of the waters of the Arkansas River.

The Colorado Commissioners in their report on the Compact stated that Article VI "fully recognizes Colorado's statutory system of water administration, particularly as to use for irrigation and other beneficial purposes in Colorado." Report and Submission by the Commissioners for Colorado of the Arkansas River Compact, *reprinted in Senate Hearing, supra* note 2, at 26 (Article VI) (Jt. Exh. 15); *House Hearing, supra* note 2, at 20 (Article VI) (Jt. Exh. 16). This report was submitted to Congress for consideration in connection with approval of the Compact, *Senate Hearing, supra* note 2, at 21-27 (Jt. Exh. 15); *House Hearing, supra* note 2, at 15-21 (Jt. Exh. 16),

and the Kansas Commissioners did not disagree with the interpretation of Article VI by the Colorado Commissioners. The Master states that Article VI-A(2) must be read in conjunction with Article IV-D and "was not meant to override the obligations of Colorado under Article IV-D." Report at 193-94. However, nothing in Article IV-D states that pre-compact wells in Colorado are limited to pumping the amounts that were pumped during the pre-compact period. This is a limitation which the Master has read into Article IV-D based on his assumption about what the Compact Commissioners intended, an assumption which is not supported by the wording of Article IV-D, the report of the Colorado Commissioners, or the subsequent practice of the parties.

Moreover, the Master's interpretation of the Compact is contrary to the provisions of the Compact when considered as a whole. Article V-H of the Compact provides that "the ditch diversion *rights*" from the Arkansas River in Colorado Water District 67 and in Kansas between the Stateline and Garden City "shall not hereafter be increased beyond the total present *rights* of said ditches" without the Compact Administration making findings that no material depletion of usable flows will result from such increase. Arkansas River Compact, Art. V-H. (emphasis added). The term "rights" is significant in this context. The Compact Commissioners understood that the operation of John Martin Reservoir would change the regime of the river, Jt. Exh. 5 at 2-3, and that diversions by ditches in Water District 67 and in Kansas might increase as the result of implementation of the Compact. *House Hearing, supra* note 2, at 32 (Statement of George S. Knapp) (Jt. Exh. 16). Increases in the *amounts* diverted by

these ditches were not prohibited by the Compact so long as their ditch diversion *rights* were not increased without a finding of no material depletion of usable flows. Thus, it is consistent with Article V-H to permit amounts diverted by pre-compact wells to increase so long as their *rights* are not increased. And, in fact, that was how wells in Colorado were administered without complaint by Kansas for 36 years.

The Master rejected this argument because he concluded, based on Article V-H of the Compact, that: "I cannot believe that the compact was intended to limit increased diversion rights, but to allow new rights to be later established for wells that would change the river allocation between the states." Report at 194. The Master's response is wrong on two counts. First, rights for pre-compact wells in Colorado may have been *decreed* after the Compact became effective, but those rights were *established* by appropriation prior to the date the Compact became effective. *Black v. Taylor*, 128 Colo. 449, 264 P.2d 502, 506-07 (1953); *see Colorado v. New Mexico*, 459 U.S. 176, 179 n. 4 (1982) (describing the prior appropriation doctrine). Ditch diversion rights in Colorado are based on rates of flow in cubic feet per second of time. Because weather conditions vary substantially from year to year in Colorado, diversions are not limited to a specific volume of water, but by the needs of the land for which the right was appropriated. *City of Colorado Springs v. Bender*, 148 Colo. 458, 366 P.2d 552, 555 (1961); RT Vol. 84 at 21 (Helton). Therefore, as witnesses for both states testified, the amount of water pumped by wells will vary in any particular year depending on the crops grown, hydrologic conditions, economic factors, and, in the case of

wells used as a supplemental source of supply, the amount of surface water available. RT Vol. 22 at 61, 81-82, 83-84 (Book); RT Vol. 130 at 42-46 (Simpson); RT Vols. 84 at 19-21; 134 at 78-82, 96, 99 (Helton).

The Compact Commissioners clearly understood that ditch diversions in both states, measured in acre-feet, vary from year to year. Jt. Exh. 5 at 2-3, 22. This was permitted so long as the diversion *rights* of the ditches were not increased. Thus, in the case of rights to divert ground water, it is consistent with Article V-H to hold that the Compact did not prevent increased diversions by wells as long as their rights were not increased. And, for many years, the parties acted in accordance with this understanding. The Colorado State Engineer did not limit diversions by pre-compact wells to the volume of ground water pumped during the period when the Compact was negotiated, and Kansas never suggested that pumping by pre-compact wells must be so limited.

The Master disagreed with Colorado about what the Kansas Commissioners who negotiated the Compact understood because he "[did] not believe that any of the commissioners, either from Colorado or Kansas, had in mind the development of the deep turbine pump or the possibility of such a dramatic increase in pumping." Report at 194-95.

Colorado does not dispute that some portion of the increase in pumping by pre-compact wells was due to the replacement of centrifugal pumps with more efficient turbine pumps. However, this occurred in both states without objection. Jt. Exh. 105 at 40; Kan. Exhs. 447 at 112 (all but four of the irrigation wells in Finney and Gray

Counties, Kansas, were equipped with centrifugal pumps); 448 at 92-93 (most irrigation wells in the Arkansas Valley in Hamilton and Kearny Counties, Kansas, were equipped with centrifugal pumps). Given the lack of data to estimate pumping in the 1940s, Report at 199, and the fact that Kansas did not complain at the time about such a conversion or increases in pumping, Colorado believes that owners of pre-compact wells should be permitted to pump in accordance with Colorado law, in amounts which vary from year to year depending on hydrologic conditions and other factors, as they had for the 36 years before Kansas filed this lawsuit. Moreover, not only is this interpretation of the Compact supported by the long-standing conduct of the parties, it is necessary to avoid prejudice to Colorado from Kansas' delay in complaining about well pumping. As will be clear from the discussion of the evidence that follows, Kansas' delay has made it virtually impossible to reconstruct the historical record of pre-compact well pumping.

But, even if the increased pumping due to turbine pumps is "improved or prolonged functioning of existing works" for the purposes of Article IV-D of the Compact, Colorado presented a reasonable method to factor out the increased pumping due to turbine pumps based on the average amounts pumped per well during the 1940s, using estimates made by Colorado's experts. Report at 195-96. The Master rejected Colorado's method on the basis that Article IV-D did not permit *any* increased pumping after the Compact became effective. *Id.* at 194-95. He also rejected the pumping estimates made by Colorado's experts and accepted the pumping estimates made by the USGS as a basis to estimate the pre-compact

pumping allowance. *Id.* at 199-200. Colorado takes exception to this ruling.

B. THE USGS ESTIMATES FOR THE 1940S ARE NOT SUPPORTED BY POWER DATA AND THE MASTER'S REASONS FOR ACCEPTING THOSE ESTIMATES ARE NOT REASONABLE

Colorado made estimates of pumping during the 1940s, which averaged 25,228 acre-feet per year. Report at 185. In 1940, a very dry year, Colorado estimated that ground water pumping in Colorado was 36,837 acre-feet. Colo. Exh. 165*, Table A.1. In 1948, a very wet year, Colorado estimated that ground water pumping was 24,475 acre-feet. *Id.*[48]

The Master rejected the estimates by Colorado's experts for the 1940s on the grounds that "[p]rior to the trial of this case, pumping for 1940-49 had been estimated in five separate hydrologic reports," and "[n]one of these reports, however, estimated amounts that approached the yearly average of 25,228 acre-feet submitted by Colorado for use in the trial." Report at 185. All five reports use

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[48] Both Kansas and Colorado started with the same power records to estimate pumping in Colorado in 1948. There were several reasons for the difference in the Kansas and Colorado pumping estimates for 1948 (11,000 acre-feet vs. 24,475 acre-feet), but the two main reasons are that Colorado estimated missing electrical power records in the Las Animas service area and assumed a higher percentage of pumping by non-electric wells than did Kansas. RT Vol. 133 at 39 (Helton). As Mr. Helton testified, the failure to estimate pumping in the Las Animas service area was not reasonable because there were a significant number of pre-compact wells in that area. *Id.* at 41.

estimates made by the USGS.[49] The USGS estimates were made by Mr. R. Theodore Hurr and have been used in various reports, but the data used by Mr. Hurr to make the estimates for the 1940s were not available, no one was sure how the estimates were reached, and Mr. Hurr died before he could be questioned about the basis on which he made his estimates. Report at 187; RT Vol. 130 at 47-49, 51-52 (Simpson). Although testimony exposed inconsistencies between the USGS pumping estimates and power records, Report at 187; RT Vol. 130 at 47-52 (Simpson), the Master accepted the USGS estimates. We address the Master's reasons for accepting those estimates.

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[49] The estimates in the 1970 USGS report are simply shown in the form of a bar chart. Jt. Exh. 66 at 8, Fig. 3. There are no numerical values given in the report for the 1940-49 ground water withdrawals and there is no explanation of how those estimates were made. The 1985 USGS report and 1986 USDA report simply republished the bar chart from the 1970 Report. Jt. Exh. 129 at 10; Jt. Exh. 108 at I-11. The 1968 Wheeler Report and the 1975 report contain numerical estimates of pumping. Jt. Exh. 92 at 22; Jt. Exh. 94 at 22. The pumping estimates in the 1968 Wheeler Report were obtained from the USGS. Jt. Exh. 91 at 9 (Volume 1 of the Wheeler Report). The 1975 report states that the data for 1940-62 is from the 1970 USGS report. Thus, all five reports use estimates by the USGS, and the estimates in four of the five reports are identical. The fifth report, the Wheeler Report, has slightly different estimates for some years between 1940 and 1965 (*e.g.*, 2,300 acre-feet for 1940 vs. 2,500 acre-feet for 1940 in the 1975 report), but those estimates came from the USGS, Jt. Exh. 91 at 9, and appear to be a preliminary version of the estimates published in the 1970 USGS report.

1. Experts Relied on the 1970 USGS Report

The Master states that experts for both states relied heavily on the 1970 USGS report in which the 15,000 acre-foot estimates appear. Report at 186. This misconstrues the reliance by the experts on the 1970 USGS report.

Experts for both states relied on the power coefficients measured by the USGS during the 1964-68 field investigation and the information on the type of power used for pumping contained in the 1970 USGS report. However, experts for neither state relied on the USGS pumping estimates for the period 1940-63 in the report. RT Vol. 69 at 95-97 (Slattery) (USGS procedure to estimate pumpage prior to 1964 is not documented and is not reasonable); RT Vol. 126 at 30 (Book) (did not form an opinion about the USGS estimates; completed his analysis based on power sold by the power companies for irrigation use). Thus, the fact that experts for both states relied on other portions of the 1970 USGS report is not a reasonable basis to rely on the pumping estimates for the 1940s in that report.

2. Major's Defense of the USGS Estimates

The Master states that Colorado called one of the authors of the 1970 USGS Report as a witness, and he "staunchly defended the accuracy of the USGS's pumping estimates." Report at 186-87. That is not a reasonable basis to accept the USGS pumping estimates. The witness, Mr. Thomas J. Major, was responsible for the inventory of

large-capacity wells from Pueblo to Swink[50] and the collection of data for the report. RT Vol. 129 at 13-14, 17. He was not qualified as an expert on pumping estimates (or otherwise) and had no involvement in making the pumping estimates in the USGS report, other than to provide information to Mr. Hurr. *Id.* at 19, 28, 56. He did not know how the ground water withdrawals plotted in Figure 3 of the 1970 USGS report were determined. *Id.* at 28. Mr. Major was asked specifically if he had determined the amounts of pumping:

> THE SPECIAL MASTER: DID YOU DETERMINE ANY AMOUNTS OF PUMPING?
>
> THE WITNESS: NO, SIR.
>
> BY MR. DRAPER:
>
> Q: AND YOU DON'T KNOW HOW THOSE DETERMINATIONS WERE MADE?
>
> A: THAT WAS TED HURR'S FUNCTION. MY RESPONSIBILITY WAS PRIMARILY TO GET THE INFORMATION TO HIM.

RT Vol. 129 at 56; *see also* RT Vol. 129 at 61-62, 63.

During cross-examination, Mr. Major was asked if he had any reason to doubt the pumping estimates in the 1970 USGS report. RT Vol. 129 at 61. Mr. Major responded that he did not develop them but had "no reason to believe that anyone would do anything that wouldn't be accurate." *Id.* at 62. The basis, and the only basis, for Mr. Major's defense of the accuracy of the USGS pumping

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[50] Swink, Colorado, is just west of La Junta, Colorado. RT Vol. 129 at 13. Thus, Mr. Major was responsible for the inventory of wells in the upstream reach of the study. *Id.* at 13, 15.

estimates was that those figures were subject to the normal USGS peer review and checking and he had no reason to doubt Mr. Hurr's work. *Id.* That is not a reasonable basis to accept Mr. Major's opinion. *See* Fed.R.Evid. 703. Mr. Major was not qualified as an expert in making pumping estimates, Fed.R.Evid. 702, and wasn't qualified to give an opinion that experts in making pumping estimates would reasonably rely upon pumping estimates made by Mr. Hurr. Moreover, Mr. Major did not know how those estimates had been made and did not know what data had been used by Mr. Hurr. RT Vol. 129 at 63. Thus, it is not reasonable to rely on his opinion as a basis to accept the USGS pumping estimates.

3. Fellhauer

The Master states that the Colorado Supreme Court in *Fellhauer v. People*, 167 Colo. 320, 447 P.2d 986, 991 (1968), stated that in 1940 only 2,000 acre-feet were being pumped from wells in the Arkansas Valley in contrast to the estimate of 36,837 acre-feet calculated by Colorado for this trial. Report at 187. The Colorado Supreme Court apparently relied on the USGS estimate for its statement. However, the amount of pumping in 1940 was not a fact which was necessary to the Court's determination in that case, and uncritical use of that estimate does not establish that it is reasonable.

4. 1975 Report

The Master states that Colorado also used the USGS data in its 1975 report prepared for the proceeding before

the water court and introduced into evidence. Report at 187. The Colorado State Engineer's Office did use the USGS pumping estimates for 1940-62 in its 1975 report, Jt. Exh. 94 at 22, Table 7, but also included electric power data in the report. *Id.* Dr. Danielson, who supervised the collection of data for the 1975 report, RT Vol. 76 at 87-88, testified that the USGS pumping estimates for the 1940s appeared to be suspicious based on the electric power data in the 1975 report, RT Vol. 77 at 9-10, and did not appear to be reasonable. RT Vol. 78 at 83-84, 118. Dr. Danielson also testified that the State Engineer's Office was under considerable time pressure to complete the 1975 Report for use at trial and generally used whatever data was available without further analysis. RT Vol. 76 at 94-96. Thus, the mere fact that the USGS pumping estimates were used in the 1975 report does not establish that those estimates are reasonable. *See* RT Vol. 78 at 86, 118.

5. Book's Testimony

The Master states that from the Kansas viewpoint, its expert testified that while he thought the 15,000 acre-foot figure estimated by the USGS for 1948 was high, it was nonetheless reasonable. Report at 187.[51] However, the Kansas expert, Mr. Book, assumed that the percentage pumped by non-electric powered wells in Colorado did not increase prior to 1964, even though 1940 census data (Colo. Exh. 115 at 209) and a Bureau of Reclamation study in 1943 and 1944 on a portion of the Bessemer Terrace

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[51] In contrast, Colorado estimated that pumping in 1948 was 24,475 acre-feet. Colo. Exh. 165*, Table A.1.

(Colo. Exh. 114) showed a much higher percentage of wells powered by non-electric sources. RT Vol. 126 at 43-44, 51-55 (Book); Colo. Exh. 165*, Table 7.1.[52] He also made no attempt to estimate missing power records in the Las Animas, Lamar, and Holly service areas when he estimated pumping for 1948. RT Vol. 24 at 7; *see* RT Vol. 69 at 110-12 (Slattery) (Kansas did not estimate missing data for the Las Animas service area which is not reasonable.); Kan. Exh. 689 at 4 (memo prepared by Mr. Book stating that Colorado's estimates for the Lamar and Las Animas Power Company service areas were an additional significant reason for differences in the estimates in early years). Thus, the difference between the Kansas and Colorado estimates of pumping in 1948 (11,000 acre-feet vs. 24,475 acre-feet) results primarily from differences in assumptions about missing data, RT Vol. 126 at 54-57 (Book), data which could have been obtained or estimated with more accuracy if Kansas had complained earlier. Furthermore, Mr. Book did not make estimates for

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[52] For example, in the CENTEL (Southeast Colorado Power Company) service area and the western portion of the SECPA service area, Mr. Book calculated non-electric pumping as three percent of the total pumping, limited to a total of 2,200 acre-feet based on the maximum non-electric pumping estimated by the USGS during the 1964-68 study. RT Vol. 22 at 75 (Book). Mr. Book admitted that he had no information on non-electric pumping in those areas prior to 1964. RT Vol. 23 at 115. Census data in 1940 reported 344 wells in the Arkansas River Valley, of which only 100 were electric wells. Colo. Exh. 165*, Table 7.1. The inventory of wells by the Bureau of Reclamation in 1943 and 1944 on the portion of the Bessemer Terrace, which was in the Southeast Colorado Power Company service area, indicated that 44 wells were powered by gas and 87 were powered by electric pumps. *Id.*

years prior to 1948 and did not rely on the USGS estimates in making the Kansas estimates. RT Vol. 126 at 30.

6. Basis for the Colorado Estimates

The Master states that even though cross-examination of Mr. Book did expose some inconsistencies between the USGS pumping estimates and the power data in Table 7 of the report prepared by the Colorado State Engineer's Office, Report at 187, "the evidence is without dispute that the published power records for this early period were incomplete, and it may well be that it is the power data on Table 7 not the pumping estimates that are inaccurate." *Id.* at 188.

First, there is no way to know if the USGS pumping estimates are accurate because there is no data to support those estimates and the person who made them is dead. Second, no one knew exactly where the power data in Table 7 came from, Report at 187, RT Vol. 126 at 58; but the power data used by Colorado's experts for the period 1940-49 was obtained from Colorado State University (CSU), which had collected the data from the power companies. RT Vol. 69 at 102; Colo. Exh. 88.b.[53] Cross-

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[53] From 1957 to 1974, CSU collected data from utilities throughout the State of Colorado on power sold for irrigation use. RT Vol. 69 at 99-102 (Slattery). It collected some data in the Arkansas River Valley which goes back as far as 1932. Colorado used the data collected by CSU to make pumping estimates for the years 1940-74, when available, supplemented by records of the Public Utilities Commission, when those were available. Colo. Exh. 165*, Table 2.2 (summary of process used to estimate missing power records for basin). Kansas used virtually identical power data for the years 1948-59 based on a tabulation of

examination of Mr. Book also showed that the USGS estimates for the 1940s were inconsistent with the power data collected by CSU. RT Vol. 126 at 64-66. Mr. Hal D. Simpson, the Colorado State Engineer, testified that the USGS estimates for the 1940s were not consistent with the power data obtained by CSU and were not consistent with studies by the Bureau of Reclamation in 1943 and 1944 because they do not reflect any variation due to wet and dry years. RT Vol. 130 at 47-52 (Simpson). Moreover, there was testimony that the 1940s, with the exception of 1940, in general were a wet period and that surface diversions in Colorado were much above average which would have resulted in below average ground water use. RT Vol. 82 at 133 (Helton).

7. Virtually Nothing Is Known about the Power Figures, but the Pumpage Estimates Have Been Accepted

The Master states that virtually nothing is known about the power figures on Table 7 of Jt. Exh. 94, but the USGS pumping estimates have been accepted, published, and used by the State of Colorado, the courts, the U.S. Department of Agriculture, and the USGS as late as 1985. Report at 188. First of all, Colorado's experts used power data collected by CSU from the utilities, not the power figures on Table 7 of Jt. Exh. 94. Second, the USGS pumping estimates may have been accepted, published, and used by others, including the Colorado State Engineer's

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power company records prepared by the USGS, except for years when it used ledger sheets to estimate power sold in the Southeast Colorado Power Association service area. Report at 207.

office, but those estimates are not supported by power data, no one knew how they were made, they are not reasonable, and they were not used by experts for either state to estimate pumping for the period 1950-63.[54]

8. Lack of Discussion of Pumping During the Compact Negotiations

In addition to the foregoing reasons for adopting the 15,000 acre-foot figure, the Master states that "[c]urrent well pumping in Colorado appears simply not to have been a matter of concern to the compact commissioners." Report at 101; *see also* Report at 195 ("Pumping at the time was so insignificant that it did not even enter the discussions."). He states: "Had pumping been of any appreciable magnitude, I cannot believe that such use of water would not have surfaced in the engineering committee report and the compact negotiations." *Id.* at 101.

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[54] The Master also states that, moreover, there was persuasive testimony by one of the authors of the 1970 USGS report as to the accuracy of that USGS publication. Report at 188. As pointed out, Mr. Major was not an expert in making pumping estimates, did not determine the pumping estimates in the USGS report, and did not know how they were made. Given those facts, his testimony is hardly persuasive. Likewise, the fact that the USGS estimates were made much closer to the time period involved and without the pressure of trial advocacy, Report at 200, does not suggest that the USGS estimates are likely to be more accurate than Colorado's estimates when there is no evidence that the USGS collected any power records earlier than 1948 or even used power records to make the estimates for the 1940s. RT Vol. 130 at 49, 51-52 (Simpson).

First, the Compact Commissioners clearly knew that there was well pumping in both states. *E.g.*, Kan. Exh. 205A at 2; Colo. Exh. 623 at 29-30; *Colorado v. Kansas*, 320 U.S. at 399 (describing testimony that farmers in Kansas who could be served by existing ditches had elected to install pumping systems because of lower costs). Moreover, reports published in 1943 and 1944 in Kansas estimated that ground water withdrawals for irrigation in the Arkansas River Valley in Hamilton, Kearny, and Finney Counties were approximately 50,100 acre-feet in 1939. Kan. Exh. 448 at 97-98 (23,000 acre-feet pumped in Hamilton and Kearny Counties); Kan. Exh. 447 at 118 (27,100 acre-feet pumped in the Arkansas River Valley in Finney County). Thus, the fact that pumping in Colorado was not discussed during the Compact negotiations does not suggest that pumping was insignificant or that Colorado's estimates are unreasonable.

Second, the engineering committee report specifically noted that the diversion records did not include amounts pumped by wells. *Id.* at 3 ("Irrigation supplies derived from pumps in both states are not included in the tabulated diversions."). The engineering committee never completed its studies. Colo. Exh. 57; RT Vol. 13 at 5-10 (Littlefield). Thus, the fact that the engineering committee report does not contain estimates of pumping and the absence of discussion of pumping during the Compact negotiations does not suggest that Colorado's estimates are unreasonable. If anything, the absence of discussion of pumping indicates that the Compact Commissioners assumed that rights of pre-compact well owners would

be administered in accordance with state law. Arkansas River Compact, Art. VI-A(2).[55]

9. Concerns With Colorado's Estimates

As the final reason for adopting the USGS estimates of pumping for the 1940s, the Master states that he has concerns about the higher pumping estimates developed by Colorado for the 1940-49 period. Report at 189. Basically, he concluded that there was considerable uncertainty in the estimates of pumping during the 1940s because of the lack of information and rejected Colorado's estimates because they were inconsistent with the USGS estimates, which had been used and accepted in other reports. Report at 189-90. This penalized Colorado for the fact that data was missing because of Kansas' delay in complaining. Because it was unreasonable to accept the USGS estimates of pumping for the 1940s, estimates for which there was no underlying data, Colorado recommends that the case be remanded to the Master to determine the amount pumped by pre-compact wells based on their Colorado rights or, in the alternative, the amount pumped prior to the Compact.

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[55] The Commissioners for Colorado who negotiated the Compact stated in their report to the Governor and the General Assembly on the proposed Compact that Article VI of the Compact "fully recognizes Colorado's statutory system of water administration, particularly as to use for irrigation and other beneficial purposes in Colorado." *Report and Submission by the Commissioners for Colorado of the Arkansas River Compact, reprinted in Senate Hearing, supra* note 2, at 26 (Article VI) (Jt. Exh. 15).

IV. INCREASES IN STATELINE FLOWS RESULTING FROM THE 1980 OPERATING PLAN WERE NOT "SEPARATELY BARGAINED FOR" AND SHOULD OFFSET DEPLETIONS TO USABLE STATELINE FLOWS

In April 1980, the Arkansas River Compact Administration adopted an Operating Plan for John Martin Reservoir ("1980 Plan"). Report at 47, 173; Jt. Exh. 21, Doc. 11.[56] The 1980 Plan established storage accounts in John Martin for Kansas and ditches in Colorado Water District 67. Report at 47, 173; 1980 Plan, Subsection II D(2) (Report-App. at 111). The Plan guarantees Kansas 40 percent of releases from conservation storage, which go into the Kansas account in John Martin, thereby allowing Kansas to call for releases from John Martin more nearly in accord with crop demands. Report at 47, 173; RT Vol. 84 at 106-07, 109-10 (Helton). Under the Plan, Kansas receives a greater percentage of the releases from conservation storage than it had received in the 1950s and 1960s. Report at 175; RT Vol. 84 at 107 (Helton). Moreover, by allocating a specific percentage of the releases from conservation storage to Kansas, Kansas cannot diminish

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[56] A copy of the 1980 Plan, as slightly modified in 1984, is included in the Report-Appendix at 107-17. Since the 1984 revisions had no effect on the provisions relevant to Colorado's exceptions, we will refer to it. The provisions of the 1980 Plan are described in the Report. Report at 47-48, 173-74. The provisions of the Arkansas River Compact governing the storage and release of water from John Martin Reservoir and the way in which the 1980 Plan modified the historical method of operating the reservoir are more fully described in Order Granting Kansas' Motion to Dismiss Colorado's Well Counterclaim (July 31, 1992). Report at 450-54.

or invade the portion of conservation storage which Colorado ditches are entitled to demand, thereby protecting Kansas from a claim that post-compact well development in Kansas has resulted in additional releases from conservation storage in violation of the Compact. Report at 226-27; Colo. Exh. 300.

The 1980 Plan also authorized three Colorado ditch companies to store "other" water in John Martin. Report at 47, 174; 1980 Plan, Section III (Report-App. at 114-15). This "other" water consists of water which, for the most part, would otherwise be stored in off-channel reservoirs in Colorado. Report at 47-48. As a condition of storing this "other" water in John Martin, the Colorado ditch companies are required to contribute 35 percent of their stored water to a Kansas Transit Loss Account to assist in delivering water released from the Kansas account to the Stateline. *Id.* at 48, 174; 1980 Plan, Subsection III D (Report-App. at 115).

While Kansas has questioned the authority of the Compact Administration to adopt the 1980 Plan, it has accepted the Plan since 1980 and has not exercised its continuing right to terminate the Plan. Report at 48 note 21, 172.[57]

The evidence at trial showed that Kansas received more usable water than it would have received without the 1980 Plan and, in addition, was able to demand

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[57] The 1980 Plan provided that it would continue until March 31, 1981, and year to year thereafter, provided that either Colorado or Kansas could terminate the Plan by giving written notice by a date certain each year. 1980 Plan, Subsection VII A (Report-App. at 116).

releases from John Martin when the water was more beneficial for crop production. RT Vols. 84 at 109-10; 133 at 68-74 (Helton).[58] On the other hand, the three Colorado ditch companies were permitted to store "other" water in John Martin, which is more efficient than off-channel reservoirs in Colorado, and each of the ditches in Water District 67 received its own separate account and could call for water when it was most needed. Report at 176.

The Master concluded that, because the Plan provided benefits to both Kansas and Colorado which were "separately bargained for," the benefits received by Kansas under the Plan should not offset Compact violations. Report at 180-81. Colorado takes exception to this ruling.[59]

The Master rejected Colorado's argument that the increases in usable Stateline flow resulting from the adoption of the 1980 Plan should offset depletions to usable Stateline flows from post-compact well pumping because he concluded that the Plan was intended only to improve the efficiency of the operation of John Martin and nothing in the Plan indicated that it was intended as an offset against compact violations or as a solution to the impact of well pumping in Colorado. Report at 177.

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[58] Based on the results of the Kansas H-I Model, the net increase in usable Stateline flows resulting from the 1980 Plan was about 23,500 acre-feet, using the Durbin usable flow method with the Larson coefficients. Colo. Exh. 975, Comparison 9. The increase does not fully offset depletions to usable Stateline flows from post-compact well pumping, but it does reduce those depletions.

[59] Colorado does not take exception to the Special Master's ruling that the 1980 Plan is not a complete bar to Kansas' claims.

The Master overlooked the first "whereas" clause in the resolution adopted by the Compact Administration. The first "whereas" clause states that the Compact Administration "recognizes that, because of changes in the regime of the Arkansas River, the present operation of the conservation features of John Martin Reservoir does not result in the most efficient utilization possible of the water under its control; . . . " Report-App. at 107. The resolution does not state that post-compact well pumping in Colorado or Kansas was a cause of changes in the regime of the Arkansas River; but Mr. Corrigan, the Kansas Water Commissioner, and Mr. Bentrup, a Kansas representative to the Compact Administration, both of whom were involved in developing the Plan, Report at 173, testified that they suspected that the transit losses below John Martin were due to well pumping. Colo. Exhs. 21 at 165-66; 17 at 49-55.

The Master acknowledges that there were concerns about transit losses, but states that "the evidence indicates that the problem lay primarily with surface diversions by the Colorado ditches, not with wells." Report at 179. This finding is not supported by the record. Ditches in Water District 67 are entitled to divert water released from John Martin for them. Because of transit losses during the dry years of 1977 and 1978, releases from John Martin for Kansas did not produce an equivalent in Stateline flow. RT Vol. 77 at 100 (Danielson). In 1978, the Colorado water commissioner for Water District 67 issued an order to Colorado ditches below John Martin ordering them not to divert during the first 24 hours of a release from John Martin to assist in satisfying a demand by Kansas by an equivalent in Stateline flow, Report at 180;

Arkansas River Compact, Art. V-E(3), but two ditches refused to comply. Report at 180. Thus, the transit loss problem did not lie with surface diversions. That was simply the way the water commissioner had attempted to address the transit loss problem.[60] Both Mr. Corrigan and Mr. Bentrup testified that they suspected the transit losses were in part due to well pumping, but Mr. Bentrup testified that "[t]he methods of getting the water, we figure, were the responsibility of the State of Colorado. It was their responsibility to get the water to the state line. How they did it was really no concern of ours." Colo. Exh. 17 at 56.

The 1980 Plan was drafted in response to Kansas' complaints about transit losses, the objections by the Colorado ditches to the order issued by the water commissioner in 1978, and Kansas' insistence that it was Colorado's responsibility to get Kansas' water to the Stateline.[61] By allocating 40 percent of releases from conservation storage to the Kansas account, by establishing a Kansas Transit Loss Account with water which had been historically used in Colorado, and by making other changes, the 1980 Plan reduced the transit losses and offset some of the depletions caused by post-compact

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[60] Colorado concluded that the water commissioner had erred in ordering the ditches in Water District 67 not to divert. The appropriate course of action would have been for the Compact Administration to increase the release from John Martin "to meet extraordinary conditions." Arkansas River Compact, Art. V-C.

[61] Colorado does not agree that Colorado, rather than the Compact Administration, has the responsibility to deliver water to the Stateline. RT Vol. 77 at 94-95, 97-99 (Danielson).

well pumping in Colorado. RT Vols. 77 at 101 (Danielson); 133 at 68-74 (Helton). General principles of contract law dictate that the increases in usable Stateline flows resulting from the Plan should offset depletions to usable Stateline flows caused by post-compact well pumping in Colorado.[62]

The goal in awarding damages for breach of contract is generally to put the injured party in as good a position as he would have been in had the contract been performed. Restatement (Second) of Contract §344(a) and comment a, §345(a) (1981). However, the injured party cannot recover damages "for loss that the injured party could have avoided without undue risk, burden, or humiliation." Restatement (Second) of Contract §350(1). Likewise, the injured party is not entitled to recover damages which it in fact avoided.

Where, as here, the Compact Administration adopted a plan for more efficient utilization of water under its control because of changes in the regime of the Arkansas River, without determining the cause of those changes, Kansas should not be entitled to recover damages for depletions to usable Stateline flows which did not occur because of the adoption of the Plan. The Special Master suggests, however, that the additional benefits from the 1980 Plan were "separately bargained for," *i.e.*, that the additional benefits were simply an inducement to get

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[62] Since a compact is a contract, the Court has looked to general principles of contract law. *Texas v. New Mexico*, 482 U.S. at 129 (citing Restatement (Second) of Contracts §33(2) and comment b (1981)).

Kansas to accept the Plan. However, the Compact Administration adopted the plan for more efficient utilization of water under its control because of changes in the regime of the Arkansas River. Report-App. at 107. Had there been no changes in the regime of the river, including post-compact well pumping in Colorado and Kansas, there is no reason to assume that the Compact Administration would have adopted the 1980 Plan or that Colorado would have agreed to the Plan. Under those circumstances, Kansas should not be allowed to recover damages that were avoided by adoption of the 1980 Plan. *See* Restatement (Second) of Contracts §89(c) (A promise modifying a duty under a contract not fully performed on either side is binding to the extent that justice requires enforcement in view of material change of position in reliance on the promise.). Colorado relied upon the 1980 Plan in not making demands for releases from John Martin which it was otherwise entitled to make under the Compact. Therefore, to the extent the Plan increases Stateline flows, those increases should offset depletions to usable Stateline flows caused by post-compact well pumping in Colorado.

V. KANSAS SHOULD BE REQUIRED TO PROVE A BREACH OF THE COMPACT BY CLEAR AND CONVINCING EVIDENCE

The Special Master recognized that Kansas, as the plaintiff, had the burden to prove its case. Report at 65. However, he concluded that Kansas need only meet the "preponderance of the evidence" test applicable to ordinary civil litigation, rather than the higher "clear and convincing evidence" test which has been applied in

other controversies between states, *e.g.*, *Colorado v. Kansas*, 320 U.S. 383, 393 (1943); *Alabama v. Arizona*, 291 U.S. 286, 292 (1934); *North Dakota v. Minnesota*, 263 U.S. 365, 387 (1923); *Washington v. Oregon*, 297 U.S. 517, 524 (1936); *Missouri v. Illinois*, 200 U.S. 496, 521-22 (1906). Report at 69-70. Colorado takes exception to this ruling.

The Master began his analysis by noting that in *Nebraska v. Wyoming*, 507 U.S. at ___, 113 S.Ct. at 1694-95, 123 L.Ed.2d at 329-30, the Court had restated its "long-standing" rule that a state seeking an equitable apportionment of an interstate stream must present clear and convincing proof of some real and substantial injury or damages. Report at 65. However, he stated that *Nebraska v. Wyoming* had involved a new refinement of that rule:

> The opinion states that where a Supreme Court decree has been issued in an interstate river apportionment case, a state instituting a later proceeding to *enforce* the decree need not meet the strict standard of proof applicable in the initial proceeding.

Report at 66 (emphasis in original).

The Master then stated that a resulting question "is whether or not the Arkansas River Compact is analogous to a Supreme Court decree, so that Kansas' suit may be viewed as one to enforce the compact and therefore as a proceeding subject to a less demanding evidentiary test than clear and convincing proof." Report at 66.

After discussing two background matters, the Master concluded that the preponderance of the evidence test should apply because he could see no reason why an interstate compact should have any less standing than a

decree of the Court and because rights and duties set forth in a compact ought not be harder to enforce than a decree of the Court. Report at 69-70. While suggesting that the burden of proof might be different depending on the nature of the provision of the Compact be enforced, he ruled that Kansas need only satisfy the traditional burden of proof in ordinary civil litigation to enforce the rights and duties of Article IV-D of the Compact, *i.e.*, the preponderance of the evidence. *Id.* at 70. Colorado disagrees with the Master's analysis and his conclusion.

A standard of proof "serves to allocate the risk of error between the litigants and to indicate the relative importance attached to the ultimate decision." *Herman & MacLean v. Huddleston*, 459 U.S. 375, 389 (1983), *quoting Addington v. Texas*, 441 U.S. 418, 423 (1979); *accord Colorado v. New Mexico*, 467 U.S. 310, 323-24 (1984). As the Court said in *Addington v. Texas*:

> The function of a standard of proof, as that concept is embodied in the Due Process Clause and in the realm of factfinding, is to "instruct the factfinder concerning the degree of confidence our society thinks he should have in the correctness of factual conclusions for a particular type of adjudication."

441 U.S. at 423, *quoting In re Winship*, 397 U.S. 358, 370 (1970) (Harlan, J., concurring).

In civil cases, "society has a minimal concern with the outcome of such private suits, . . . " and a plaintiff is required to prove facts by a "mere preponderance of the evidence." *Addington v. Texas*, 441 U.S. at 423. By contrast, the "clear and convincing evidence" standard has been

required "where particularly important individual interests or rights are at stake." *Herman & MacLean v. Huddleston*, 459 U.S. at 389.

In *Colorado v. Kansas*, the Court addressed the burden of proof on a complaining state to prove an increased depletion to the water supply:

> The question must be answered in the light of rules of decision appropriate to the quality of the parties and the nature of the suit.
>
> In such disputes as this, the court is conscious of the great and serious caution with which it is necessary to approach the inquiry whether a case is proved. *Not every matter which would warrant resort to equity by one citizen against another would justify our interference with the action of a state, for the burden on the complaining state is much greater than that generally required to be borne by private parties. Before the court will intervene the case must be of serious magnitude and fully and clearly proved.* [Emphasis added.]

320 U.S. at 393-94 (footnote omitted).

Contrary to the Master's contention, Report at 68, the Court has explained the reasons for the higher burden of proof in equitable apportionment cases and in other cases where one state seeks the assistance of the Court to interfere with actions of another state. Such cases involve interests of quasi-sovereign states and frequently involve important questions of public law. *Washington v. Oregon*, 297 U.S. at 529 ("We are to bear in mind steadily that the controversy is between states, and not between private litigants, the burden and quantum of the proof being governed accordingly," *citing North Dakota v. Minnesota*,

263 U.S. 365 [1923]".); *Virginia v. West Virginia*, 234 U.S. 117, 121 (1914) ("As we have pointed out, in acting in this case from first to last the fact that the suit was not an ordinary one concerning a difference between individuals, but was a controversy between states, involving grave questions of public law, determinable by this court under the exceptional grant of power conferred upon it by the Constitution, has been the guide by which every step and every conclusion hitherto expressed has been controlled."); *Missouri v. Illinois*, 200 U.S. at 520-21.

The higher burden on the complaining state is tempered by the liberal rules allowing full development of the facts in controversies between states, *United States v. Texas*, 339 U.S. 707, 715 (1950), rules which are also applied to guard against the possibility of error. As the Court said in *Virginia v. West Virginia*, in allowing West Virginia to file a supplemental answer which would have been denied in a case between ordinary litigants:

> This conclusion, which we think is required by the duty owed to the moving state, also in our opinion operates no injustice to the opposing state, since it but affords an additional opportunity to guard against the possibility of error, and thus reach the result most consonant with the honor and dignity of both parties to the controversy.

234 U.S. at 121.

Thus, the quality of the parties, the importance of a just resolution of controversies between states, and the need to guard against erroneous factual conclusions in such cases are the reasons for the higher burden of proof in cases between states. The Master concluded that the

preponderance of the evidence standard should be applied in this case, however, because he felt that rights and duties set forth in a compact ought not to be harder to enforce than they would be if contained in a decree of the Court. Report at 75. This confuses an action to enforce a judgment with a case in which one state alleges that another state has breached an interstate compact.

This Court has the right to enforce its judgments in controversies between states. *Virginia v. West Virginia*, 246 U.S. 565, 591 (1918); *see Spallone v. United States*, 493 U.S. 265, 276 (1993) (courts have inherent power to enforce compliance with their lawful orders through contempt). A decree in a controversy between states is entered only after the Court has determined that the case is of serious magnitude and fully and clearly proved, and has reached a result which is "most consonant with the honor and dignity of both parties to the controversy." *Virginia v. West Virginia*, 234 U.S. at 121. The Court, having given the states the "amplest opportunity to be heard" and applied the "largest justice" to the disposition of the case, has a substantial interest in seeing its decree complied with. *Id.* Applying a higher burden of proof to a subsequent proceeding to enforce the decree would lessen the force of the Court's decree by making it more difficult to enforce.[63]

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[63] Consider, for example, where a court in a civil case has made a finding which requires a higher burden of proof, *e.g.*, charges of fraud, suits on oral contracts to make a will, suits to establish the terms of a lost will, suits for specific performance of an oral contract, 2 McCormick on Evidence §340 at 443-44 (3rd ed. J. Strong, ed. 1992) (listing classes of cases in which higher burden of proof applies), and has entered a decree determining the rights of the parties. The court doesn't have the same

The Master felt that the same considerations apply in a suit to enforce rights and duties set forth in an interstate compact. This misunderstands an important distinction between a judicial determination of rights in a case between states and a compact.

A judicial decree in a case between states is limited to a determination of rights based on a present, existing controversy. *Massachusetts v. Missouri*, 308 U.S. 1, 15 (1939). It is entered only after the Court has determined that the case is of serious magnitude and fully and clearly proved, and has carefully weighed the evidence and reached a decision which is fair and equitable. *Virginia v. West Virginia*, 234 U.S. at 121.

A compact on the other hand is a method for resolving an interstate matter without a judicial determination of rights. *Hinderlider v. La Plata River & Cherry Creek Ditch Co.*, 304 U.S. 92, 104 (1938). A compact can be more flexible; it can address matters which are not the subject of a present controversy, including, as in this case, future developments. While it may be true that in some cases the rights and duties set forth in a compact could have been determined by a decree of this Court, it is also true that in some cases the rights and duties set forth in a compact could not have been judicially determined at the time the compact was entered and may not have received the same careful crafting as a judicial decree. Thus, different considerations are present in an action to enforce a decree of the Court.

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reason to apply a higher burden of proof to an action to enforce the decree that it did in making the finding in the first instance.

Moreover, the higher burden of proof in a case to enforce a compact is consistent with the rules allowing full development of the facts that were applied in this case.[64] The Court allows full development of the facts in cases between states to guard against the possibility of error. The "clear and convincing" standard of proof should apply for the same reason.

In discussing "background matters," the Master stated the higher standard penalizes downstream states which will invariably be the party which is required to carry the burden, and that such a rule does not appear consistent with the equality of right among states. This is not correct. As the opinions in *Colorado v. New Mexico*, 459 U.S. 176, 187-88 (1982); 467 U.S. 310, 315-17 (1984), make clear, the burden of proof does not invariably fall upon the downstream state in equitable apportionment cases.

Further, the Master's reasoning ignores the fact that the limitations of Article IV-D and V-H in the Arkansas River Compact apply equally to Kansas, the downstream

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[64] Although the Pre-Trial Order had set a cut-off date for identifying exhibits, Report-App. at 73-74, Kansas repeatedly sought leave to offer revised and new exhibits on the grounds that in a case between states, the Court allows full development of the facts. *E.g.*, RT Vol. 9 at 88-89. Further, Kansas sought a lengthy continuance to replace its chief technical expert, and the Special Master granted the continuance in part for the same reason. Report-App. at 91. It is simply not fair to allow a plaintiff state to take advantage of the liberal rules allowing full development of the facts, then apply the preponderance of the evidence standard. If society does not have a significant interest in the outcome of compact enforcement suits between states, there is no reason to apply the liberal rules allowing full development of the facts in such cases.

state. The Colorado Commissioners who negotiated the Arkansas River Compact insisted that the provisions of Article IV-D and V-H apply to Kansas because they were concerned that Kansas would increase its irrigated acreage and place a greater demand on releases from John Martin Reservoir. Record of the Twelfth Meeting of the Colorado-Kansas Arkansas River Compact Commission at 12-13 (Feb. 3, 4, 5, and 6, 1948); Record of the Seventeenth Meeting at 17-33 to 17-36 (Dec. 13 and 14, 1948) (Jt. Exh. 3). Thus, the downstream state is not invariably the complaining party in an equitable apportionment case or an action to enforce a compact apportioning an interstate stream.

Nor is the higher burden of proof in interstate water cases inconsistent with the equality of right among states.[65] The rules of procedure and the higher burden of proof in cases between states reflect the equal level or plane on which all states stand under our constitutional system, and the importance of confidence in factual conclusions before the Court will interfere with the actions of a state.

Finally, even if the preponderance standard would otherwise apply, Kansas' delay in bringing its claims should "gravely add" to the burden it would otherwise bear. *Colorado v. Kansas*, 320 U.S. at 394.

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[65] The equality of right does not imply some sort of mathematical equality. *See Connecticut v. Massachusetts*, 282 U.S. 660, 670-71 (1931).

CONCLUSION

Colorado recommends that its exceptions to the Special Master's Report be granted and that the case be remanded to the Master for further proceedings and completion of the remedy phase consistent with the Court's opinion.

Respectfully submitted,

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No. 105, Original

In The
Supreme Court of the United States
October Term, 1994

STATE OF KANSAS,

Plaintiff,

v.

STATE OF COLORADO,

Defendant.

ON EXCEPTIONS TO THE REPORT OF
THE SPECIAL MASTER

BRIEF OF THE STATE OF WYOMING AS *AMICUS CURIAE*

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ON EXCEPTIONS TO THE REPORT OF THE SPECIAL MASTER

BRIEF OF THE STATE OF WYOMING AS *AMICUS CURIAE*

The State of Wyoming submits this brief as *amicus curiae* pursuant to Sup.Ct.R. 37.5. This brief is submitted in compliance within the time permitted for exceptions to the Special Master's Report. *Kansas v. Colorado*, 115 S.Ct. 48 (1994); Sup.Ct.R. 37.3.

INTEREST OF THE STATE OF WYOMING AS *AMICUS CURIAE*

The State of Wyoming is the defendant in the pending original action brought by the State of Nebraska to modify the Court's North Platte River Decree, *Nebraska v. Wyoming*, 325 U.S. 589 (1945), *modified*, 345 U.S. 981 (1953). *Nebraska v. Wyoming*, No. 108 Original. In addition, Wyoming is a party to

both interstate compacts and Court decrees governing the use of its waters. *E.g.*, *Yellowstone River Compact*, 66 Stat. 663 (1951); *e.g.*, *Wyoming v. Colorado*, 259 U.S. 419, 496, *modified*, 260 U.S. 1 (1922), *vacated and new decree entered*, 353 U.S. 953 (1957). Therefore, the State of Wyoming has a direct interest in the proper and equitable administration of water rights on an interstate basis.

The Special Master's Report in this case includes a discussion and a recommendation with regard to the standard of proof necessary to prevail in interstate water allocation suits before this Court. Special Master's Report at 65-70. To the extent that discussion could be read as a recommendation that the Court reconsider the traditional high burden of proof most recently repeated and applied in *Nebraska v. Wyoming*, 113 S.Ct. 1689 (1993), Wyoming takes exception to that recommendation. Wyoming's brief is directed solely toward the Special Master's discussion of the burden of proof in cases involving the equitable apportionment of interstate streams. Wyoming does not address the factual matters contained in the Special Master's Report.

SUMMARY OF ARGUMENT

The State of Wyoming is the defendant in a pending original action in which the Court has announced that it will rely on well-established precedent to require proof of real and substantial injury by clear and convincing evidence before exercising its extraordinary power to limit or restrict Wyoming's sovereign power over its portion of an interstate stream. As a result, Wyoming finds no merit or support for the recommendation that the Court relax the standard of

proof imposed in interstate water disputes. The Court established the standard of proof in recognition of the dignity and status of the parties as sovereign states. The Court should retain the standard in order to prevent the compromise of the rights of states except in the most necessary situations. Moreover, in the nearly ninety years since the precedent was established, states have come to expect that they must meet a high standard of proof, both to invoke the Court's jurisdiction and to obtain relief in such cases. Any change in the standard could have a substantial effect on the number of cases filed to invoke the Court's original jurisdiction.

ARGUMENT

IN AN ACTION BETWEEN STATES THE STANDARD OF PROOF SHOULD REMAIN ELEVATED WHEN THE REMEDY SOUGHT WOULD ALTER THE RIGHTS OF THESE STATES

The Special Master's Report contains a brief section on the standard of proof in this proceeding. Report of the Special Master, Section VIII, pp. 65-70. However, the conclusion reached in those five pages affects enormously the remainder of the questions the Special Master addresses in his report and, if adopted, could change the rules in equitable apportionment cases within the Court's original jurisdiction.

The Special Master recommends that Kansas be required to prove its case by only a preponderance of the evidence. Special Master's Report at 70. However, the Special Master does not limit his discussion of the issue to the controversy at hand. His commentary on the

development of the standard of proof touches upon all interstate original jurisdiction water rights litigation. Much of his discussion traces the development of the clear and convincing evidence standard of proof applied by the Court to equitable apportionment of interstate streams. Special Master's Report at 65. *See, e.g., Idaho v. Oregon*, 462 U.S. 1017, 1027 (1983). He then concludes that there is no real explanation for the clear and convincing evidence standard in original jurisdiction actions. Special Master's report at 66, 68.

Included in the discussion is an unsupported perception that geography and gravity may compound an inherent unfairness to applying the standard in apportionment proceedings:

> Second, on an interstate stream, the downstream state will normally be the complaining party. As such it will also invariably be the party which is required to present a very strong case in order to obtain relief. In contrast to actions involving private water rights, the Court's special rule for burden of proof in equitable apportionment cases adds a significant legal inequality to the natural inequality already imposed by geography. The ideal of federalism - that each state is on an equal footing with all other states - seems poorly served by a rule which routinely penalizes all downstream states.

Special Master's Report at 68-69.

The Special Master overlooks that the reason for the heightened standard in original actions relates to

the nature of the litigants: states that enjoy sovereignty limited only by the U.S. Constitution. *Gulf Offshore Co. v. Mobil Oil Co.*, 453 U.S. 473, 478 (1981). In recognition and respect of that sovereignty, the Court restricts the exercise of its jurisdiction over the states to controversies of a serious magnitude. The Court will not exercise its original jurisdiction over states except in cases of absolute necessity. *Alabama v. Arizona*, 291 U.S. 286, 291 (1934). The Supreme Court's original jurisdiction provides an alternative to settling important controversies between sovereigns that traditionally could be settled only through diplomacy or war. *North Dakota v. Minnesota*, 263 U.S. 365, 372-73 (1923), *Nebraska v. Wyoming*, 325 U.S. at 608, *Mississippi v. Louisiana*, 113 S.Ct. 549, 553 (1992).

The heightened standard of proof expresses the Court's policy that the controversies between states within its original jurisdiction have a certain dignity and seriousness. The Court applies the higher standard to limit the cases it hears and to guide the use of its extraordinary power in those cases it accepts in its original jurisdiction. The nature of the parties, whether states or private litigants, directly bears upon the burden and quantum of proof. *Washington v. Oregon*, 297 U.S. 517, 529 (1936). The fact that these disputes are not ordinary lawsuits between individuals, but controversies between states, involving grave questions of public law, has guided the Court in its determinations. *Virginia v. West Virginia*, 234 U.S. 117, 121 (1914). Before the Court will act, a threatened invasion of rights must be of serious magnitude and established

by clear and convincing evidence. *Wyoming v. Oklahoma*, 502 U.S. 437 (1992). As the Court noted in *Colorado v. Kansas*, 320 U.S. 3823(1943):

> The question must be answered in the light of rules of decision appropriate to the quality of the parties and the nature of the suit. In such disputes as this, the Court is conscious of the great and serious caution with which it is necessary to approach the inquiry whether a case is proved. Not every matter which would warrant resort to equity by one citizen against another would justify our interference with the action of a state, for the burden on the complaining state is much greater than that generally required to be borne by private parties. Before the Court will intervene the case must be of serious magnitude and fully and clearly proved.

Id. at 393.

While the Special Master says that the higher standard of proof is a "latecomer" in original actions, Special Master's Report at 66, the standard has been the rule that has guided the Court in all of its interstate water cases. *See, e.g., Missouri v. Illinois*, 200 U.S. 496 (1906). Furthermore, the time when a precedent was developed holds no particular bearing on the weight it carries. For example, the importance of the rights articulated first in *Miranda v. Arizona*, 384 U.S. 436 (1966), is not diminished because they were announced only some 36 years ago. The importance of the higher standard of proof is the reason the Court continues to apply it in contemporary interstate water proceedings.

E.g., Colorado v. New Mexico, 467 U.S. 310 (1984), *Nebraska v. Wyoming*, 113 S.Ct. 1689 (1993). Relaxing the standard would foster more frequent attempts by states to invoke the Court's original jurisdiction and dissuade states from attempting to resolve their differences without resorting to litigation.

In *Nebraska v. Wyoming, supra*, the Court discussed the difference between an action to enforce rights already adjudicated and an action to modify those rights. *Nebraska v. Wyoming*, 113 S.Ct. at 1694-96. In an enforcement proceeding, a plaintiff need show only a violation of those rights in order to prevail; a showing of injury is not required. 113 S.Ct. at 1695, *citing Wyoming v. Colorado*, 309 U.S. 572, 581 (1940). However, if a state seeks a new apportionment or a modification of an existing apportionment, no pre-existing right exists to enforce or interpret. 113 S.Ct. at 1695. In that case a state must make a showing of substantial injury to be entitled to relief. *Id.* at 1696.

> That is so not only because a new injunction would work a new infringement on sovereign prerogatives, but also because the interest of certainty and stability counsel strongly against reopening an apportionment of interstate water rights absent considerable justification.

Id. Wyoming urges the Court to continue to adhere to that precedent.

The Special Master suggests that in this case the standard should not apply because of Kansas' perceived disadvantage as a downstream state. Special Master's Report at 68-69. That observation is unsupported and

incorrect if it implies that only downstream states are plaintiffs in equitable apportionment cases. In *Colorado v. New Mexico*, 467 U.S. 310 (1984), Colorado, the upstream state, sought an apportionment of the Vermejo River. *Id.* at 312. In *Arizona v. California*, 460 U.S. 605 (1983), the upstream state, Arizona, was the plaintiff in a dispute to apportion the waters of the Colorado River. In pending proceedings before the Court, Wyoming has brought counterclaims against downstream Nebraska alleging Nebraska violations of the North Platte Decree. *Nebraska v. Wyoming*, No. 108, Original. Moreover, geography plays no role at all in other interstate disputes where the Court applies the higher burden of proof to limit the cases it considers under its original jurisdiction. *E.g., Wyoming v. Oklahoma*, 502 U.S. 437 (1992). Geography - or the law of gravity - has no bearing on whether to apply the higher standard of proof to decide whether to interfere with a state's sovereign rights.

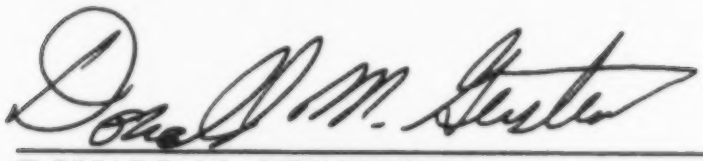
CONCLUSION

This Court has applied a heightened standard of proof to its original jurisdiction cases between states in order to recognize and protect the dignity and sovereignty of the litigants. The Court should continue to apply the higher standard in interstate disputes within its original jurisdiction. To the extent the Special Master recommends a break from precedent, the Court should decline the recommendation.

Dated: November 17, 1994

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In The

Supreme Court of the United States

October Term, 1985

STATE OF KANSAS,

Plaintiff,

v.

STATE OF COLORADO,

Defendant,

UNITED STATES OF AMERICA,

Defendant-Intervenor.

COLORADO'S REPLY BRIEF

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No. 105, Original

In The

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COLORADO'S REPLY BRIEF

The State of Colorado submits this reply to Kansas' Exceptions to the 1994 Report of the Special Master and Brief in Support of Exceptions (Kansas' Brief).

I. INTRODUCTION

Special Master Arthur L. Littleworth, Esq., presided over 141 days of trial, over a period of more than two years, much of it involving highly technical expert testimony. Report at 28-31. He has prepared a 459-page report which addresses the claims of the parties and sets forth his conclusions and recommendations on those claims. While Colorado does not agree with every ruling of law and finding of fact made by the Master, he is to be

commended for a thorough and carefully considered report. He has stated the reasons for his decisions and identified the evidence on which he relied in reaching his decisions. We note this at the outset because Kansas does not fairly or accurately describe the Special Master's decisions to which it takes exception.

II. THE MASTER CORRECTLY GRANTED COLORADO'S MOTION TO DISMISS KANSAS' TRINIDAD RESERVOIR CLAIM

Kansas first takes exception to the Master's decision granting Colorado's motion to dismiss Kansas' Trinidad Reservoir claim at the conclusion of Kansas' evidence. Kansas' Brief at 12-26. Kansas contends that "violation of the Compact Administration's duly adopted Trinidad Reservoir Operating Principles constituted a violation of the [Arkansas River] Compact." *Id.* at 12. Kansas further contends that the Compact Administration "adopted" the Operating Principles to implement and prescribe procedures for the operation of Trinidad Reservoir under Article VIII-B of the Compact.[1] *Id.* at 15. Kansas argues that the Operating Principles are therefore mandatory and enforceable without proof of a violation of Article IV-D of the Compact. *Id.* at 15-24.

The Master articulated the issue in his decision:

> The fundamental issue on which the Colorado motion turns is whether Kansas is required to show a material depletion in stateline flows

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[1] The provisions of the Compact are set forth in Exhibit 1 of the Appendix to the July 1994 Report of the Special Master. Report-App. 1-17.

> caused by the operation of Trinidad Reservoir, or is required to prove only that the Operating Principles for the Project were violated, and that such violation caused less water to flow into John Martin Reservoir than would have occurred under strict compliance with the Operating Principles. Kansas did not attempt to establish that the flows of the Arkansas River at the state line were less than they would have been if the Trinidad Project had not been constructed or operated at all.

Report at 379.[2] The Master concluded that the Operating Principles had not been "adopted" by the Compact Administration to prescribe procedures for the operation of Trinidad Reservoir under Article VIII-B of the Compact and that Kansas' evidence did not establish a Compact violation. *Id.* at 407-28.

The Master's decision so well describes the evidence, Kansas' arguments, and the basis for his decision that we will merely summarize the essential points of his decision.

A. Background to the Master's Decision

The Master describes the Trinidad Dam and Reservoir Project, the development of Operating Principles for the Project, and Kansas' complaints about the operation

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[2] Decision of Special Master on Colorado's Motion to Dismiss Kansas' Trinidad Reservoir Claim (Jun. 9, 1992), *printed in* the July 1994 Report of Arthur L. Littleworth, Special Master, Part III, Vol. III at 373-433. Because the Report is paginated consecutively from beginning to end, we will simply cite to the page numbers of the Report.

of the Project in his decision. Report at 380-99. Very briefly, Congress authorized the Trinidad Project in 1958 to meet flood control and irrigation needs on the Purgatoire River near the City of Trinidad, Colorado. *Id.* at 382-87; Flood Control Act of 1958, Pub. L. No. 85-500, 72 Stat. 297, 309 (Jt. Exh. 35).[3] After the Trinidad Project was authorized, the U.S. Bureau of Reclamation ("Bureau") conducted operation studies on the irrigation function of the Project. Report at 388. The initial study was completed in 1961. *Id.* The concept of equal sharing of the Project water supply among the various irrigation ditches assumed in the 1961 operation study was unacceptable to the Purgatoire River Water Conservancy District[4] and a revised operation study was completed in 1964, which included Operating Principles for the Project. *Id.* at 388-89. The Operating Principles were submitted for review and were approved by the U.S. Army Corps of Engineers, the Colorado Water Conservation Board, and the Purgatoire River Water Conservancy District. *Id.* at 391. In addition, the Operating Principles were submitted to the Kansas Water Resources Board and the Compact Administration. *Id.*

In December 1966, the Governor of Kansas asked the Bureau to agree to five conditions to the Operating Principles, to which the Bureau and the Purgatoire River

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[3] The page numbers in the reporter's transcript at which exhibits were admitted are indicated in the Table of Exhibits.

[4] The Purgatoire River Water Conservancy District was formed in December 1960 for the purpose of contracting with the United States for repayment and management of the Project water supply and to represent the irrigation systems to be included in the Project in conducting the irrigation studies for the Project. Jt. Exh. 24a at vi, 7.

Water Conservancy District agreed, and the Operating Principles, as so amended, were approved by the Compact Administration in 1967. Report at 391-95.

In February, 1967, the United States entered into a repayment contract with the Purgatoire River Water Conservancy District for construction, operation, and maintenance of Trinidad Reservoir in accordance with the Operating Principles. Report at 393-94; Jt. Exh. 39.

The Corps of Engineers then constructed Trinidad Dam and Reservoir and substantial storage of water began in 1979. Report at 395-96.[5] In 1980, Kansas complained about the way Trinidad Reservoir was being operated. *Id.* at 397.[6] Kansas requested an investigation by the Compact Administration, which made findings of fact, but could not agree that the operations were in violation of Article IV-D of the Compact. Report-App. at 56.

B. The Bureau of Reclamation's Review of the Trinidad Project Operating Principles

The Master noted that Kansas' legal theory is based upon an alleged violation of Operating Principles for the

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[5] Trinidad Reservoir was completed and declared ready to store water on January 1, 1977, but litigation in Colorado delayed any substantial storage until March 1979. Report at 395-96; *Purgatoire River Water Conservancy District v. Kuiper*, 197 Colo. 200, 593 P.2d 333 (1979) (reversing trial court order enjoining storage in the reservoir).

[6] Kansas' prompt complaint about the operation of Trinidad Reservoir stands in stark contrast to its lengthy delay in complaining about post-compact well pumping in Colorado.

Trinidad Project. Report at 378. The Master assumed for the purpose of his ruling that the Trinidad Project had been operated in violation of the Operating Principles, *id.*, but concluded that merely showing that operation of the Project had not been in accordance with the Operating Principles did not prove a violation of Article IV-D of the Compact. *Id.* at 424-28. He noted that the operating studies on which the Operating Principles had been based had predicted an increase in inflow to John Martin Reservoir of 400 acre-feet per year. *Id.* at 390. During a review of the Operating Principles which was completed in December 1988, the Bureau developed a computer model to reconstruct its earlier operation studies. *Id.* at 399. The model showed that under the conditions of the 1964 study the inflow to John Martin would have actually increased by an average of 1,000 acre-feet per year compared to a "without project" condition. *Id.* Using the model, the Bureau then assumed operation with two practices about which Kansas had complained in this case. *Id.* at 400. The estimated inflow to John Martin Reservoir predicted by the model was less, but still showed an average increase of 300 acre-feet annually. *Id.*

The Bureau concluded on the basis of these and other studies that the two practices about which Kansas had complained would not cause the future usable inflow to John Martin Reservoir to be less with the Trinidad Project than it would have been without the Project. Report at 401.

The Bureau also did additional studies to compare actual operation of the Trinidad Project during the years 1979 through 1984 with operation of the Project in strict compliance with the Operating Principles. Report at 402. The Bureau did three "case studies." It concluded that

Case 1, which showed a net increase in flows into John Martin Reservoir of 3,500 acre-feet over the study period, was the most reasonable for the purpose of evaluating injury to downstream rights. *Id.* at 403. However, the Bureau cautioned that none of the 1979-84 studies was a sound basis for evaluating future impacts of the Project and did not compare the actual operation of the Project to operation without the Project. *Id.* at 404.[7]

Based on its review, the Bureau concluded that the two practices about which Kansas had complained were departures from the intent of the Operating Principles and recommended that the practices be discontinued until the Operating Principles had been amended to permit the practices. Report at 404-05. The Colorado State Engineer then informed the Purgatoire River Water Conservancy District that he would administer the Project water rights consistent with the Bureau's interpretation of the Operating Principles until they had been amended or until a court of competent jurisdiction had determined that the practices were not a violation of the Operating Principles. *Id.*; Jt. Exh. 52.

C. Kansas' Evidence

At trial, Kansas' expert, Brent E. Spronk, using the Bureau's Case 1 and Case 3 studies, calculated depletions

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[7] The Bureau stated that it had investigated making a "without project" comparison but concluded that there was not sufficient information available to make meaningful comparisons. Report at 404. The Bureau did not say that a "no-project" comparison was "impossible." Kansas' Brief at 9. Nor did Kansas' expert, Brent E. Spronk, claim that such a study was impossible. *See* Report at 412.

to the inflow to John Martin Reservoir based on the differences between actual inflows during the 1979-84 period and inflows that would have occurred under strict compliance with the Operating Principles. Report at 410. In making this analysis, Mr. Spronk looked only at the months in which depletions had occurred to the inflow to John Martin compared to operation in strict compliance with the Operating Principles, then totalled the depletions. *Id.* As the Master states: "He deliberately chose not to offset those depletions by the many months during which the Trinidad Project increased inflows to John Martin." *Id.* On that basis, Mr. Spronk concluded that the additional inflow into John Martin Reservoir during the 1979-84 period, under strict compliance with the Operating Principles, would have been between 24,500 acre-feet and 27,500 acre-feet, of which he assumed Kansas would have been entitled to 40 percent. *Id.*

This analysis reflected Kansas' legal theory that any depletion to the inflow to John Martin Reservoir in any month resulting from failure to operate the Project in strict compliance with the Operating Principles was a Compact violation *per se*. Report at 407-09.[8] It also reflected Kansas' legal theory that the Operating Principles had to be complied with each month, without consideration of averages. *Id.* at 410. As the Master pointed out:

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[8] As the Master points out, the legal theory advanced at trial was not apparent from the face of the complaint. Report at 407. Moreover, at a conference with the Master in 1988, counsel for Kansas had agreed that Kansas had to prove a material depletion of Stateline flow caused by the Trinidad Project. Transcript of Proceedings (Sep. 28, 1988) at 39-40 (Colo. Appendix at 1a).

> Under the evidence in this case, such a measure of damages would afford Kansas significant benefits from the project, as opposed to merely protecting Kansas and other downstream users against material depletions.

Id. at 409.

D. Summary of the Master's Decision and Reasons for Rejecting Kansas' Claim

The Master concluded that the evidence presented by Kansas did not establish a violation of Article IV-D of the Compact because it was not based on an analysis of what the inflows to John Martin would have been if the Project had not been operated during the years 1979-84. Report at 411-12, 423-26. Mr. Spronk testified that such a study was not necessary to determine the depletions that had occurred as a result of departures from the Operating Principles and would be difficult to do because of uncertainty in estimating diversions in the absence of the Project. *Id.* at 412.[9]

The Master also rejected Kansas' argument that the Compact Administration had "adopted" the Operating Principles to implement and prescribe procedures for operation of Trinidad Reservoir under Article VIII-B of the Compact:

> I have carefully examined the record presented here of the Compact Administration's

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[9] However, that was exactly what Kansas attempted to do when it developed the H-I Model to estimate changes in Stateline flow assuming the Winter Water Storage Program had not been operated. Report at 231-32.

> consideration of the Trinidad Project. I find nothing to indicate that the Compact representatives of either State thought they were exercising binding authority under Article VIII-B. And the consequences of such authority, as argued by Kansas, makes it less rather than more appropriate that such action should be implied.

Report at 415. One consequence of such authority would be that no change in the operation of the Project could be made without a unanimous vote of both states. Arkansas River Compact, Art. VIII-D.

The Master pointed out the problem with Kansas' argument by turning the facts around. Report at 415. "Assume," he said, "that the Operating Principles were strictly observed, but nonetheless the actual Trinidad operations still caused a material depletion in the usable flows to Kansas users." *Id.* He stated: "Under the Kansas legal theory, the State of Kansas would have no recourse so long as the Operating Principles had been adopted by the Compact Administration pursuant to Article VIII-B." *Id.* He stated: "Colorado disagrees with this Kansas view, and so do I." *Id.* at 416 (footnote omitted). The Master concluded:

> Under the assumed facts, Kansas would permit the Compact Administration to write out of the Compact the critical Article IV-D requirement that no new development in Colorado may cause a material depletion in usable flows to Kansas users. Such action would not implement, but rather would amend the Compact. Of course, the Compact Administration was not delegated power to change the Compact. No matter what operational criteria are followed,

> that is, whether the project is operated in compliance with the Operating Principles, or not, or under appropriately modified Principles, the requirements of Article IV-D must still be met.

Id. at 416.

The Master went on to note that other provisions of the Compact also cast doubt on Kansas' theory that the Compact Administration had authority to prescribe procedures under the Compact to bind Colorado, the Purgatoire River Water Conservancy District, or the United States on the operation of the Trinidad Project. Report at 417-18.[10]

The Master recognized that Kansas argued that the Operating Principles were enforceable as binding action by the Compact Administration apart from any violation of Article IV-D of the Compact because it wants to use the unanimous consent requirement of the Compact to veto amendments to the Operating Principles in order to preserve significant benefits from the Project. Report at 409, 419. The Master not only rejected Kansas' argument, but admonished Kansas that it could not unreasonably withhold approval of amendments to the Operating Principles simply to preserve benefits from the Project at the expense of water users who had contracted with the

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[10] Earlier the Master had ruled that the historical record did not support Kansas' argument that the Compact negotiators had intended to give the Compact Administration power to control future federal operations on the Arkansas River. Report of Special Master Re Winter Storage Motions (Sep. 15, 1989), *printed in* Report at 350. Kansas did not take exception to this ruling.

Purgatoire River Water Conservancy District to administer their water rights in return for repayment of the Project's costs. *Id.* at 423-24, 425, 432.

Kansas argues, however, that unless the Operating Principles are binding on Colorado, the Compact Administration's approval of the Operating Principles was "a useless act." Kansas' Brief at 22. This argument misunderstands the role of the states in the review of federal irrigation projects and the powers of the Compact Administration under the Compact.

Section 1(c) of the Flood Control Act of 1944, 33 U.S.C. §701-1(c)(1988) (Colo. Appendix at 3b-4b), requires the Secretary of the Interior to submit plans, proposals, and reports for irrigation and purposes related thereto to the Secretary of the Army and "affected States"[11] for their "views and recommendations." Report at 348. In the event a submission of views and recommendations made by an affected state sets forth objections to the plans or proposals covered by the report of the Secretary of the Interior, the proposed works shall not be deemed authorized except upon approval by an act of Congress, 33 U.S.C. §701-1(c), although in practice the Secretary of the Interior generally does not proceed with reclamation projects without congressional authorization. A. Golze, *Reclamation in the United States* 125 (1961) (Colo. Appendix at 1c). Thus, affected states have an opportunity to submit "views and recommendations" on federal plans, but not the right to approve or disapprove such plans. Report at 348.

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[11] The term "affected State or States" is defined in Section 1(a) of the Flood Control Act of 1944. 33 U.S.C. §701-1(a) (Colo. Appendix at 2b).

The submission of the Operating Principles to the Kansas Water Resources Board and the Compact Administration was consistent with the policy expressed in Section 1 of the Flood Control Act of 1944, although it was not required since the Trinidad Project had already been authorized by an act of Congress.

The Compact Administration's review and approval of the Operating Principles was also consistent with its powers under the Compact. The Compact Administration has authority to investigate violation of the Compact or other actions prejudicial thereto. Arkansas River Compact, Art. VIII-H. As a result of an investigation, the Compact Administration can make findings and recommendations to the state official who is charged with the administration of water rights for appropriate action. *Id.* However, the findings of fact made by the Compact Administration are not conclusive in any court or before any agency or tribunal, *id.*, Art. VIII-I, and recommendations by the Compact Administration are not and were not intended to be binding on state officials in the event they disagreed with the Administration's recommendations. At the seventeenth and final meeting of the Commission which negotiated the Compact, the Commissioners clarified the powers of the Compact Administration in response to proposals by J.W. Dixon of the Bureau of Reclamation to modify Article V-H of the Compact:

> Chairman Kramer asked Commissioner Ireland to make a statement for the Record. . . . Commissioner Ireland stated that it had been brought out that the effect of the proposals as expressed by Mr. Dixon would be to grant quasi-judicial functions to the Administration,

> something that might not be possible from a constitutional standpoint, even though all the parties desired it; that it had been suggested that if Mr. Dixon's wording constituted the setting up of a condition precedent which would prevent any attempt to go into court, or any attempt to transfer or exchange water regardless of the merits of the situation, until there was a confirmation, and required that such a confirmation have the unanimous concurrence by both Colorado and Kansas as represented on the Administration, then the context should be modified; that it should be consistent with other language in the Compact, as to the extent to which findings of fact by the Administration would be applicable; that the findings would constitute nothing more than prima-facie evidence if they were question [sic]; that they would not be final and conclusive; that it had been emphasized, that whether or not the Compact would in the future be violated by one state or another was up to the respective state officials who would make such determination; that if the officials of one or the other state thought there had been a violation, the only recognized remedy would be for it to go into Court; that this would ultimately mean the United States Supreme Court; . . .

Record of Seventeenth Meeting of the Colorado-Kansas Arkansas River Compact Commission at 17-83 to 17-84 (Jt. Exh. 3).[12]

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[12] Commissioner Ireland's statement is consistent with earlier statements during the Compact negotiations. Record of Twelfth Meeting of the Colorado-Kansas Arkansas River Compact Commission at 12-48 (Statement by General Kramer) (Jt.

The Compact Administration's review and approval of the Operating Principles is consistent with the limited powers conferred upon the Administration to conduct investigations and make findings of fact and recommendations. *See* Report at 341-50. Thus, as the Master notes, the mere fact that the Administration reviewed and approved the Operating Principles does not suggest that the representatives from either state thought they were exercising binding authority to prescribe procedures for the operation of a federal reservoir under Article VIII-B of the Compact. *Id.* at 415.

Moreover, the Compact Administration's approval of the Operating Principles does not mean that a departure from the Operating Principles would necessarily result in a material depletion in violation of Article IV-D of the Compact. Report at 422. As the Master points out, even if one were to construe the Compact Administration's approval of the Operating Principles as a finding of fact that a departure from the Operating Principles would result in a Compact violation,[13] that finding would be merely "prima facie evidence of the facts found." *Id.* at 421; Arkansas River Compact, Art. VIII-I. As the Master notes, there is "ample evidence" in the record on which a trier of fact could determine that the departures from the Operating Principles of which Kansas had complained

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Exh. 3) (Colo. Appendix at 1d); *id.* at 12-52 to 12-53 (Statement read by Attorney General Hinckley of Colorado) (Colo. Appendix at 1d-2d).

[13] A more reasonable interpretation of any such finding would be that compliance with the Operating Principles would not result in a Compact violation. Report at 422. The converse is not necessarily true, since a departure from the Operating Principles could actually benefit Kansas.

had not materially depleted the inflow to John Martin under the Compact. Report at 421.

Kansas argues that the Master's ruling allowed Colorado to disregard the Trinidad Project Operating Principles "with impunity." Kansas' Brief at 9. Colorado has never suggested that the Purgatoire River Water Conservancy District or Colorado could disregard the Operating Principles "with impunity." However, Colorado insisted that if Kansas wanted to assert a claim based on failure to comply with the Operating Principles, the Purgatoire River Water Conservancy District should be joined as a party in the action, *see* Fed.R.Civ.P. 19, and that this Court was not the only forum for such an action and not necessarily the appropriate forum for such a lawsuit. RT Vol. 1 at 39-44; *United States v. Nevada*, 412 U.S. 534 (1973) (per curiam) (denying motion for leave to file suit against Nevada where local water right owners would not have an opportunity to participate and federal district court had concurrent jurisdiction). Kansas did not allege a claim for failure to comply with the Operating Principles and did not seek to join the Purgatoire River Water Conservancy District; instead, it asserted a Compact violation against Colorado. Having chosen not to pursue a claim for failure to comply with the Operating Principles, Kansas is in no position to claim that the Master's ruling allows the Operating Principles to be violated with impunity.

The Master addressed the arguments Kansas made in response to Colorado's motion to dismiss Kansas' Trinidad Reservoir claim at some length. Report at 380-412. Colorado has little to add to the Master's discussion except to note that Kansas had made a similar argument concerning the Winter Water Storage Program. Kansas

contended, based on a resolution adopted by the Compact Administration in 1951, that the Program could not be operated unless an operating plan had been approved by the Compact Administration. In granting Colorado's motion for partial summary judgment on this issue, the Master reviewed the limited powers granted to the Compact Administration in the Compact. *Id.* at 346-50. He stated:

> In its brief, Kansas slips back and forth between two differing statements of its position. At times, Kansas states that the Compact Administration was intended to have the authority to require "submission" of plans for Federal projects; that the Administration wanted "an official say" concerning future plans for the reregulation of native waters, "even if that say was channeled through the governors of Kansas and Colorado." [Citation omitted.] In other places, Kansas states that a right of "approval" was intended. . . .
>
> Clearly there is a difference between merely requiring Federal plans to be submitted to the Administration, and giving that Administration a veto power over the construction or operation of such projects. At best, the historical record suggests that some Compact negotiators wanted, and perhaps expected, that plans for future Federal development would be submitted not only to the affected States, but also to the Compact Administration. *However, the historical record does not support Kansas' claim that the Compact negotiators intended to give the Compact Administration power to control future Federal operations on the Arkansas River.*

Id. at 349-50 (footnote omitted) (emphasis added). Kansas did not take exception to this ruling, and the Master's ruling should be read in conjunction with his decision dismissing Kansas' Trinidad Reservoir claim.

E. Stability and Peaceful Resolution of Controversies Without Litigation Are Enhanced by the Master's Careful Decision on the Limited Powers of the Compact Administration

There is one new argument in Kansas' Brief which calls for a response. Kansas states: "The question involved here is one of principle that will determine for the indefinite future whether Kansas can rely on resolutions of the Arkansas River Compact Administration relating to details of compliance with the Arkansas River Compact." Kansas' Brief at 24. Kansas further states: "The direction that Kansas receives from the Court will also serve as a guide to other states and other interstate compact commissions and administrations." *Id.*

Colorado believes there is a principle at stake in this case, but a different and more important one than stated by Kansas. This Court has frequently urged states to resolve their differences by agreement rather than by invocation of the Court's adjudicatory power. *E.g., Colorado v. Kansas*, 320 U.S. 383, 392 (1943). In the twentieth century, interstate compacts have been widely used as a method to apportion interstate rivers. J. Muys, *Interstate Water Compacts: The Interstate Compact and Federal-Interstate Compact* 8 (National Water Commission Legal Study No. 14) (1971) (Since the Colorado River Compact of 1922, "eighteen additional compacts have been entered into

apportioning the waters of interstate streams."). However, for the most part, states have been cautious about delegating power to interstate agencies created by such compacts. The Arkansas River Compact Administration is typical of a number of interstate agencies which have carefully limited powers and require unanimous consent for action. *Id.* at 14-15, 17 ("Beyond the power to make findings, however, few commissions possess any broader authority."). On occasion, Special Masters appointed by this Court, frustrated by the limited powers of such agencies, have recommended that the Court appoint a tie-breaker to break impasses when the states did not agree, *Texas v. New Mexico*, 462 U.S. 554, 563 (1983), or establish jurisdictional prerequisites and procedural guidelines for application in future interstate compact litigation. *Oklahoma and Texas v. New Mexico*, 501 U.S. 221, 228-29 (1991).

This Court has not followed such recommendations for reasons which are rooted in our federal system. In *Texas v. New Mexico*, the Court said that "unless the compact to which Congress has consented is somehow unconstitutional, no court may order relief inconsistent with its express terms." 462 U.S. at 564. In *Oklahoma and Texas v. New Mexico*, the Court declined to remand an issue to the Canadian River Commission or to establish jurisdictional prerequisites and guidelines because "the Court 'does have a serious responsibility to adjudicate cases where there are actual, existing controversies' between States over the waters of an interstate stream." 501 U.S. at 241, *quoting Arizona v. California*, 373 U.S. 546, 564 (1963).

Considering the number of interstate compacts apportioning interstate rivers, there have been remarkably few cases involving claims for breach of such compacts. However, it would encourage litigation and make states less likely to negotiate such compacts in the future if the Court were to order relief inconsistent with the express terms of a compact or give effect to actions by a compact administration or commission which go beyond the limited powers delegated to such agencies. Many compacts have unanimous consent provisions which would make it difficult to change actions of such agencies.

Stability and peaceful resolution of controversies without litigation are enhanced by decisions, such as the Master's decision granting Colorado's motion to dismiss Kansas' Trinidad Reservoir claim, which give effect to the express terms of the Compact and the limited powers delegated to the Compact Administration.

III. THE SPECIAL MASTER CORRECTLY CONCLUDED THAT KANSAS HAD FAILED TO PROVE ITS WINTER WATER STORAGE PROGRAM CLAIM

Kansas next takes exception to the Master's finding that Kansas failed to prove that operation of the Winter Water Storage Program ("WWSP" or "Program") has violated Article IV-D of the Compact. Kansas' Brief at 26. Kansas argues that the Master erred by placing the risk of uncertainty resulting from the lack of data on Kansas and that he relied on a basis as to which the record was incomplete. *Id.* at 28-34. These arguments are without

merit. The Master's finding was not based on uncertainty resulting from the lack of data and the record was not incomplete with respect to the Master's ruling on the Winter Water Storage Program.

A. Background to the Master's Decision

The Master describes Pueblo Reservoir and the Winter Water Storage Program. Report at 43-44, 306-13. As the Master notes, irrigation during the winter months was a practice which developed in the Arkansas River Valley because of water shortages. *Id.* at 308. Farmers irrigated their lands during the winter to build up moisture in the soil for the growing season. *Id.*; RT Vol. 82 at 153-56 (Helton). Storage of winter flows was first proposed during the planning stages of the Gunnison-Arkansas Project in the late 1940s when the Bureau proposed to add Pueblo Reservoir as a feature of the project. Report at 306.[14]

An interim report describing the Bureau's plans for the Gunnison-Arkansas Project, which included storage of winter flows in Pueblo Reservoir, was provided to the Commissioners who negotiated the Compact. Report at 306; Record of Sixteenth Meeting of the Colorado-Kansas Arkansas River Compact Commission at 16-78 to 16-79 (Jt. Exh. 3) (Colo. Appendix at 1e); Colo. Exh. 643 at 12,

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[14] As the Master notes, winter irrigation below John Martin Reservoir generally ended with the construction of that reservoir and adoption of the Compact. Report at 309. Thus, the Bureau's plans related to storage of winter flows in Pueblo Reservoir for ditches in Colorado between Pueblo Reservoir and John Martin Reservoir.

¶ 51 (June 1948 interim report on the Gunnison-Arkansas Project) (Colo. Appendix at 1f); RT Vol. 11 at 125, 128-36. While the Commissioners did not determine whether the Bureau's plans could be implemented without materially depleting the waters of the Arkansas River, they did not intend to impede or prevent those plans if they could be fit within the framework of the Compact. As Commissioner Gail L. Ireland stated in his testimony to Congress:

> We have also been very careful in this compact to so prepare the same that it would not in any manner prevent proper future development, whatever may be able to be accomplished in the future, on the river. We know that the Bureau of Reclamation has plans, and this compact, in my opinion, does not stand in the way of any of those plans.

Arkansas River Compact: Hearing on S. 1448 Before the Senate Comm. on Interior and Insular Affairs, 81st Cong., 1st Sess. 15 (1949) [hereinafter cited as *Senate Hearing*] (Jt. Exh. 15). *See also* H. Kramer, *Report to the Congress of the United States on the Proposed Arkansas River Compact Between Colorado and Kansas* (1949), *reprinted in Senate Hearing* at 36 (Jt. Exh. 15) ("The above language [of Article IV-D] was evolved from extensive consultation with the affected Federal agencies. It is intended to leave the door open – as it should be – for beneficial development of the Arkansas River Basin in Colorado and Kansas by any and all proper ways and means.").

In 1962, Congress authorized the initial development of the Gunnison-Arkansas Project, which had been renamed the Fryingpan-Arkansas Project to avoid confusion with the larger Gunnison-Arkansas Project. Report at 306-07; Act of Aug. 16, 1962, Pub.L. No. 87-590, 76 Stat.

389 (1962) (Jt. Exh. 168); *Fryingpan-Arkansas Project, Colorado,* H.R. Doc. No. 187, 83d Cong., 1st Sess. 10 (1953) (letter from the Commissioner of Reclamation noting the reason for the name change) [hereinafter cited as "H.R. Doc. No. 187"] (Jt. Exh. 166). Project purposes included the reregulation of "winter flows of the Arkansas River that are presently diverted for direct-flow use but which, by agreement, could be converted to more beneficial summer use through storage in the Pueblo Reservoir." Report at 307 *quoting* H.R. Doc. No. 187 at 32, ¶ 65 (Jt. Exh. 166).

In 1964, the Bureau advised the Southeastern Colorado Water Conservancy District that it should begin to develop a program for storage of winter flows of the Arkansas River in Pueblo Reservoir. Report at 307. In 1965, the Southeastern Colorado Water Conservancy District signed a repayment contract with the United States for the Fryingpan-Arkansas Project which provided for winter storage in project reservoirs and included penalties in the form of increased payments for project water if a winter water storage program was not implemented. *Id.* n. 132.

In 1969 the Southeastern Colorado Water Conservancy District formed a Winter Storage Committee, which included representatives of all entities eligible to participate in the Program. Report at 311. Charles L. ("Tommy") Thomson, general manager of the Southeastern Colorado Water Conservancy District, served as chairman of this committee. *Id.* The initial operating plan for the Winter Water Storage Program was developed by the Southeastern Colorado Water Conservancy District and the participating water users, with assistance from the Bureau, the U.S. Geological Survey ("USGS"), and Colorado water officials. *Id.* at 355. Pueblo Reservoir was

substantially completed in 1975, *id.* at 44, and the first Program began in December of that year. *Id.* at 309, 354.[15] The Program has been operated every year since that time, with the exception of the winter of 1977-78. *Id.* at 309, 354-55.

B. The USGS Did a Study Prior to Implementation of the WWSP, and Studies in 1981 Did Not Indicate Any Adverse Impact on Kansas

Kansas states that Colorado "unilaterally initiated" the Winter Water Storage Program "without the benefit of prior sufficient studies and data collection now found necessary by the Master." Kansas' Brief at 27. This distorts the facts.

The USGS assisted with the planning for the Program and did a study prior to implementation of the Program which concluded that Stateline flows would increase. Report at 313, 355. Mr. Thomson appeared at several Arkansas River Compact Administration meetings from 1970 to 1975 to discuss planning for the Program. *Id.* at 311, 356. At the December 1975 meeting of the Compact Administration, Mr. Thomson informed the Compact Administration that the Program had begun on a three-month experimental basis. *Id.* at 311. The Compact Administration was complimentary and adopted a resolution directing its Special Engineering Committee to review

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[15] The Master states that the Program commenced in 1976. Report at 309. The Program actually began in December 1975; however, witnesses frequently used the term "Compact Year," which begins on November 1 of the preceding year. Thus, the Master's statement is correct if it is understood to mean that the Program began in Compact Year 1976.

operations of the Fryingpan-Arkansas Project and to report to the Compact Administration each year on the relationship between the Project and the Compact. *Id.* at 312, 356. Mr. Thomson was also requested to appear at the next meeting of the Compact Administration to report on the results of the Program, which he did in May 1976. *Id.* at 356.

In December 1980, Kansas expressed a concern over potential reduction of inflow into John Martin Reservoir resulting from the Program. Report at 312. The Kansas representatives to the Compact Administration suggested that a study be made, which was done by the USGS and completed in February 1981. *Id.* at 312-13; Colo. Exh. 538. The USGS performed an analysis of streamflow records and concluded that the data did not indicate that inflow to John Martin Reservoir had been reduced as the result of the Program. Report at 313; Colo. Exh. 538 at 3. The Kansas Division of Water Resources also did a comparison of streamflow records and concluded that the comparison indicated that there had not been a reduced flow since operation of Pueblo Reservoir began. Report at 313; Colo. Exh. 539. "Thus," as the Master states, "the early and preliminary reviews of winter storage did not indicate any adverse impact upon Kansas, . . . " Report at 313.

In 1981, however, Howard C. Corrigan, the Kansas Water Commissioner, discovered a resolution which had been passed by the Compact Administration in 1951. Colo. Exh. 21 at 149 (deposition of Howard C. Corrigan); Colo. Exh. 17 at 98 (deposition of Carl Bentrup). Based on the resolution, Kansas began to insist that the Program had to be approved by the Compact Administration. In 1985, Kansas requested an investigation of the Program

by the Compact Administration, but its insistence that the Program had to be approved by the Compact Administration impeded the investigation. Report at 364 ("It is evident that any earlier action by the Compact Administration concerning the winter storage program was at least impeded, and perhaps blocked, by the legal disagreement between the States over the 1951 Resolution."). Colorado moved to stay Kansas' WWSP claim to allow the Compact Administration an opportunity to investigate the claim, but Kansas opposed the motion and the Master denied Colorado's motion to stay. *Id.* 364-67.

Thus, the Program was not initiated without prior studies, and preliminary studies by the USGS and the Kansas Division of Water Resources did not show any adverse impact on Kansas from the Program. Moreover, Kansas had known about the Program since 1970, was kept well-informed about the Program thereafter, and did not raise any objection to the initiation of the Program in 1975. Report at 311-12. Nor did Kansas complain about lack of data or ask the Compact Administration to make an investigation to collect any missing data or make any findings of fact relating to the Program.

Furthermore, the Master gave Kansas every opportunity to present evidence to support its claim, granting Kansas' motion for a seven-month continuance to replace Mr. Durbin[16] after cross-examination had brought out a

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[16] Timothy J. Durbin, a former District Chief for the California District of the USGS, was the chief technical expert witness for Kansas. Report at 228. He developed the basic structure of the H-I Model and the usable flow method which Kansas originally relied upon to quantify its claims. *Id.* at 230, 235, 293-94.

serious coding error in the original H-I Model concerning the Program. Report at 28, 236-37, 315. The Master also allowed the Kansas replacement experts, over objection by Colorado, to make changes in the way the Program was represented in the model, not to correct errors in the model, but to better represent the Program. RT Vol. 88 at 29, 31-32; RT Vol. 91 at 44-50 (Book) (describing changes).[17] Having failed to prove its claim, Kansas now argues that the burden of uncertainty from the lack of data should fall on Colorado. Kansas' Brief at 29-32. In making this argument, Kansas implies that the Master's decision was based on the uncertainty in the Kansas' modeling analysis due to the lack of adequate data. Kansas' Brief at 29 ("Much of the source of the uncertainty in the WWSP analysis is the lack of adequate data."). The Master did discuss the lack of data on winter evaporation rates, but that was not the basis for his decision.

C. Summary of the Master's Decision and Reasons for Concluding that Kansas Had Not Proved the WWSP Had Caused Material Depletions to Usable Flows

In his Report, the Master reviewed the evidence presented by the parties concerning the Winter Water Storage Program and concluded that, even applying the preponderance of the evidence standard, Kansas had not proved that the Program had caused material depletions in violation of the Compact. Report at 335. The Master states:

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[17] The Kansas replacement experts also made many other changes to the H-I Model. Report at 245.

> Kansas' case has not been helped by its own contradictions in quantifying impacts to usable flow – ranging during this trial from 255,000 acre-feet initially, to 44,000, to 40,000; nor by the fact that depletions are essentially eliminated if accretions are taken into account. This is not to say that the WWSP has not adversely impacted Stateline flows, but rather that Kansas has failed to prove that it has.

Id. at 335; *see also id.* at 236 ("The major changes in Kansas' position and evidence cannot be ignored."), 315 ("In evaluating the overall persuasiveness of the Kansas case, this original evidence cannot be forgotten or ignored."). The Master then recommends "that the Court find that Kansas has failed to prove that operation of the program has violated the compact." *Id.* at 336.

Kansas takes exception to the Master's recommendation, contending that he recommended that its claim be denied because "(1) it is too uncertain; and (2) accretions might offset depletions." Kansas' Brief at 26. Kansas argues that its experts "determined there was a violation in the amount of 40,000 acre-feet of depletions to usable flow during the operation of the program (1976-85)." *Id.* Kansas states: "No other evidence of depletions or lack thereof was submitted for the 1976-85 period of operation," *id.*, and that "[t]he Master rejected the evidence of depletions, however, holding that the results are too uncertain, placing the onus of uncertainty on Kansas. . . . " *Id.* at 27. Kansas again misstates the facts and the basis of the Master's recommendation.

First, as the Master noted, Kansas was not helped by its experts' calculations of progressively less and less

depletions to usable Stateline flows for the 1976-85 period as errors in the H-I Model were discovered and corrected. Report at 335. Kansas' experts first asserted that the Program had depleted usable Stateline flows in the amount of 255,000 acre-feet. Report at 315; Kan. Exh. 112* (12-6-90) (Comparison H). However, this estimate was based, at least in part, on a serious coding error in which several lines of code had been left out in one of the "runs" of the model. Report at 238; RT Vol. 87 at 54-55, 67 (Schroeder).[18] This error was brought out during cross-examination of Mr. Durbin. Report at 28; RT Vol. 51 at 114-40. Dewayne R. Schroeder, Colorado's modeling expert, then identified sixteen coding errors and poor assumptions in the model during his testimony. Report at 238; RT Vol. 87 at 53-68.

After correcting errors and poor assumptions in the original H-I Model pointed out by Mr. Schroeder, Kansas' replacement experts presented a new estimate of depletions of 44,000 acre-feet. Report at 238, 245, 315. Even that estimate was based on an error in the revised model. *Id.* at 315. When that error was identified and corrected, the final estimate of depletions to usable Stateline flows dropped to 40,000 acre-feet. *Id.* at 315-16. However, this estimate was based on a new usable flow method developed by the Kansas replacement experts which the Master concluded was not appropriate for use with the H-I Model. *Id.* at 322. Using the usable flow method developed by Mr. Durbin, which the Master found was the best

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[18] When that error was corrected, the original H-I Model predicted that usable Stateline flows would increase by 18,800 acre-feet. RT Vol. 87 at 54, 78, 81 (Schroeder).

of the methods presented, depletions were reduced to 27,200 acre-feet. *Id.* And when accretions (increases in flows) predicted by the model from the Program were taken into account, these depletions were eliminated. *Id.* Thus, the 40,000 acre-foot figure was not the only evidence of depletions to usable Stateline flows or lack thereof submitted for the 1976-85 period of operation. It was simply the final estimate presented by Kansas to quantify its claim.

Second, the Master did not reject Kansas' claim because lack of data made the results too uncertain. Rather, he concluded that the depletions predicted by the H-I Model were not reliable and could not be considered apart from the accretions predicted by the model. Report at 327-29.

As the Master notes, both the United States and Colorado argued that accretions must be considered when evaluating the impacts of the Program. Report at 327. When accretions were taken into account using the Durbin usable flow method, "the revised H-I Model reduces depletions to 2,200 acre-feet for the whole nine-year program, or calculates an actual increase in Stateline flows, depending on how the institutional switches are set for the 1980 Operating Plan." *Id.* at 327-28, *citing* Colo. Exh. 975, Comparisons 3, 7.[19] Kansas objected to considering the accretions to usable Stateline flows because

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[19] The increase in usable Stateline flows predicted by the revised H-I Model was 2,800 acre-feet. Colo. Exh. 975, Comparison 3. This was the comparison the Kansas replacement experts relied upon to determine impacts from the Winter Water Storage Program with the revised H-I Model, Report at 316, but the Master questioned the comparison because it involved two

31,000 acre-feet of the 37,000 acre-feet of accretions to usable Stateline flows predicted by the model during the 1976-85 period had occurred in two months in 1985, right at the end of the period. Report at 328. However, as the Master notes, the timing of accretions and depletions predicted by the model was a product of the assumptions and parameters used in the modeling effort, and it seemed likely that a reservoir storage program could well provide some usable accretions that would mitigate depletions. *Id.*

The Master then noted that the evidence showed that, without regard to other criticisms about the model by the United States and Colorado, "in seven of the nine years during which the WWSP operated, the H-I model put more water into storage in John Martin Reservoir than actually occurred." Report at 328. "As a result of this artificial buildup," he stated, "the model calculated that John Martin Reservoir filled in 1985, finally producing a model spill of 255,000 acre-feet." *Id.* He noted that a spill did occur in 1985, but it was only 87,000 acre-feet. *Id.* The United States and Colorado argued that, when it simulated the operation of the Program, the H-I Model thus held water in storage that in reality flowed downstream to add to Stateline flows (and thereby would have eliminated the depletions predicted by the model); however, in

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hypothetical model runs, neither of which actually happened. *Id.* at 259-60. When the "switches" for the 1980 Plan were left on in both model runs, it changed the results from a slight accretion to a slight depletion of 2,200 acre-feet over the nine-year period; but, as the Master concluded, these depletions are well within the range of error of the model. *Id.* at 334-35.

terms of model results, the water showed up as accretions when the stored water was spilled in two months in 1985. *Id.* The Master noted that Kansas disregarded such accretions as not being usable or timely. *Id.* The Master concluded:

> There is not sufficient evidence to determine what the impact on Stateline flows would have been if the H-I Model had more closely corresponded to actual storage in John Martin and to actual releases. However, there seems to be merit in Colorado's argument, with respect to the WWSP and accretions, that the H-I Model has created "false depletions." [Citation omitted.]

Id. at 328-29.

The Master then discussed the disagreement over the proper method to calculate winter evaporation rates, but concluded:

> In the final analysis, modeling winter evaporation depends not only upon the equation used but also on the amounts and frequency of the irrigation applications, and weather conditions at those times. *However, that determination need not be made in order to decide the present WWSP claim.* I have concluded that the depletions shown by the Kansas model are well within the model's range of error. One cannot be sure whether impact or error is being shown.

Report at 334-35 (emphasis added). Thus, the Master's conclusion was not based on the uncertainty due to lack of data on winter evaporation rates; it was based on a finding that Kansas had not proved material depletions to usable Stateline flows because the depletions predicted

by the model were not a reliable basis to determine the impact of the Program.

Third, the record was not incomplete on this issue. *See* Kansas' Brief at 33-34. The Master did state, with respect to accretions predicted by the revised H-I Model in the comparison used to evaluate the impact of post-compact well pumping, that the issue needed to be examined. Report at 263. However, he specifically stated:

> This conclusion relates *only to postcompact pumping* in Colorado, and *not to the Winter Water Storage Program*. The impact, if any, of that program is discussed in Section XXII hereof.

Id. (emphasis added). In the case of Kansas' WWSP claim, there was considerable evidence presented about the accretions predicted by the revised H-I Model. *Id.* at 327-29. The fact that the Master concluded that further evidence was necessary about accretions predicted by the revised H-I Model in a different comparison does not mean that his conclusion on the Winter Water Storage Program needed to await such evidence.[20]

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[20] Furthermore, there were many other criticisms of the two model runs used to evaluate the Program with the revised H-I Model which the Master did not bother to address. Report at 326-27 & n. 144. For example, the model overpredicted the amount of water actually put into storage by about 141,500 acre-feet. *Id.* at 327. Colorado's expert, Duane D. Helton, testified that the overprediction of diversions to off-channel storage had biased the results of the model. RT Vol. 134 at 52-59.

D. Colorado's Evidence Did Not Show Depletions to Usable Flows

Kansas states that Colorado analyzed the Winter Water Storage Program using a different period and "[y]et even with several favorable assumptions, Colorado also found depletions of total flow, in excess of 9,000 acre-feet." Kansas' Brief at 26-27. Kansas misrepresents the results of Colorado's analysis.

The Colorado analysis was done by superimposing the current operating plan for the Program on the period 1950-75 and 1978, the years when the Program did not operate. Report at 317; RT Vol. 83 at 96-98 (Helton).[21]

The Colorado analysis predicted that conservation storage in John Martin Reservoir would *increase* by an average of 244 acre-feet per year. RT Vol. 83 at 145-46 (Helton); Colo. Exh. 134*, p. 8.1, col. (13). The Colorado analysis also predicted that Stateline flow during the summer, April through October, would not change, *id.*, col. (15), and during the winter, November through March, would decrease by an average of 354 acre-feet per year. *Id.*, col. (14). However, this was a depletion to *total*, not *usable* Stateline flow, and does not include the increases in Stateline flow that would have occurred as a result of the increase in conservation storage.

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[21] Colorado's expert, Mr. Helton, did not believe it was possible to predict reliably what the diversions would have been if the Program had not been operated because diversions during the period when winter irrigation had been practiced varied due to climatic conditions and the need to do maintenance on canals. RT Vol. 83 at 98-104, 107-08.

Mr. Helton concluded that the Kansas irrigators did not rely on wintertime flows because of poor water quality and icing problems. RT Vol. 83 at 63, 146. Therefore, he concluded that the small depletions predicted during the period November through March would not deplete usable Stateline flows. *Id.* at 63. The average depletion of 354 acre-feet per year can be put into perspective by comparing it to the average of 48,000 acre-feet *per year* of unused flow passing Garden City which the Bureau had estimated was available for development after the Compact became effective. *See* Colorado's Brief in Support of Exceptions at 6 n. 6; Colo. Exh. 112 at 3-4, 6.

Mr. Helton assumed that Kansas would receive 40 percent of the increase in conservation storage. Thus, he concluded that the *potential* impact of the Program on Kansas would be to increase Stateline flow by an average of 97 acre-feet per year. Colo. Exh. 134*, p. 8.1, col. (17); RT Vol. 83 at 146. Mr. Helton then went on to do a monthly analysis of the impacts of the predicted changes from the Program on usable Stateline flow, which showed that *usable* Stateline flows would have *increased* by an average of 196 acre-feet per year if the Program had been in effect during the period 1950-69. Colo. Exh. 134*, p. 9.3, col. (11); RT Vol. 86 at 80, 85-88 (Helton). Thus, Mr. Helton concluded that there was no discernable impact on either conservation storage or usable Stateline flows from the Program. RT Vol. 83 at 105-06; Vol. 86 at 87-88.

Kansas argued strenuously that the Colorado analysis was not relevant to address its claim because it was for the wrong period. Report at 317. The Master stated that he could not say that it was "legally wrong" to analyze the impact of the Program in this manner, but

concluded that it was "more appropriate" to evaluate the operations of the Program during the period it actually operated. *Id.* at 317-18. Thus, he did not rely on the Colorado analysis as the basis for his finding that Kansas had failed to prove its claim. *Id.* at 318. The Master did mention in passing that the Colorado analysis does show some limited depletions, "in excess of 9,000 acre-feet for the 27 year period studied, or about 354 acre-feet per year on average." *Id.* However, as noted above, these depletions were not depletions to usable Stateline flows and did not include the increases in conservation storage or usable Stateline flows predicted by the Colorado analysis.[22]

Kansas claims that the Colorado analysis was based on several favorable assumptions, Kansas' Brief at 30, but never demonstrated that changing assumptions in the Colorado analysis would change the results. Instead, Kansas relied on the results of the revised H-I Model because it insisted that Colorado analyzed the wrong period. *Id.*

E. The Master's Decision Was Not Based on a Finding That the 53,000 Acre-Feet of Depletions Predicted by the Revised H-I Model Were Negligible

Kansas contends that with regard to its WWSP claim, the Master concluded the 53,000 acre-feet of depletions

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[22] The Master stated that he found no specific testimony on this point. Report at 318. Mr. Helton's testimony on the impact of the Program on usable flows occurred several days after he described his analysis of the Program but is in the record. RT Vol. 86 at 80-88.

shown by the Kansas H-I Model are well within the model's range of error. Kansas' Brief at 28. Kansas then proceeds to argue that depletions of that magnitude are not negligible, *id.*, and that Colorado should have "the burden of coming forward with evidence to reduce assumed uncertainty in the Kansas evidence of depletions." *Id.* at 32.

This argument is predicated on a misconception of the Master's ruling. The Master concluded that, when accretions were taken into account, the revised H-I Model calculated depletions to usable Stateline flows of just 2,200 acre-feet for the period 1976-85 or calculated an increase in usable Stateline flows depending on how the institutional "switches" were set for the 1980 Operating Plan. Report at 327-28. He further concluded that the model did not accurately represent storage in and releases from John Martin Reservoir and, therefore, that the depletions predicted by the model were not a reliable basis to determine the impact of the Program without taking into account the accretions predicted by the model. *Id.* at 334-35. It was in that context that the Master concluded that the depletions shown by the revised H-I Model are well within the model's range of error.

Kansas also states that "the attempts by the Colorado expert to alter the Kansas model to eliminate calculated depletions did not succeed." Kansas' Brief at 32. This misrepresents Mr. Schroeder's testimony. Mr. Schroeder was highly critical of the way in which the Kansas replacement experts had calibrated the revised H-I Model. Report at 247; RT Vol. 138 at 83-88, 98. Mr. Schroeder restored the canal capacities and removed the diversion reduction factors and made other changes to the H-I

Model in order to demonstrate that the model could be calibrated without resort to such steps. Report at 288; RT Vol. 138 at 100, 105, 137. However, he believed that there were deep-rooted problems with the model, RT Vol. 112 at 43-44; Vol. 138 at 138-40, and did not offer the results as an appropriate quantification of Kansas' claims. Report at 247, 288-89. Specifically, with regard to the Winter Water Storage Program, he testified that he had not revised the parameters used in the model to predict diversions under the Program and did not believe the results of his version of the H-I Model were appropriate to evaluate the Program. RT Vol. 139 at 34.[23]

F. The Master Decision Was Not Based on Uncertainty Due to the Lack of Data

Kansas asserts: "None of the experts deny that there is uncertainty with respect to the modeling results of either state," and that "[m]uch of the source of the uncertainty in the WWSP analysis is the lack of adequate data." Kansas' Brief at 29. From this premise, Kansas then argues that "[t]he risk of the lack of adequate data should be borne by the state that initiates and benefits from post-Compact development without collecting the data within its jurisdiction or doing the studies needed to support a good faith belief that the development will comply with the Compact." *Id.* Further, Kansas asserts that "Colorado, as a practical matter, has had control over (1) existing

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[23] Diversions under the Program are predicted based on calibrated parameters. RT Vol. 128 at 96 (Larson). Mr. Schroeder did not attempt to recalibrate those parameters when he made his changes to the model. RT Vol. 139 at 34.

data in Colorado and (2) the determination whether to collect additional data that may be needed." *Id.* Kansas then argues that "because of Colorado's lack of data collection during the study period, Kansas has been blocked by the Master on the basis that there is too much uncertainty in its evidence." *Id.* at 29-30. Kansas therefore argues that the burden of proof or, at least, "the burden of production of data" should have been on Colorado. *Id.* at 30.

First of all, Kansas has failed to identify any additional data which Colorado failed to collect and which would have reduced the uncertainty in the Kansas modeling analysis. There was disagreement about the proper methodology to calculate winter evaporation rates, but the results of the revised H-I Model were based on the methodology adopted by the Kansas experts. Report at 330-31.

Second, Kansas' argument is inconsistent with the Arkansas River Compact. The Compact provides that the Compact Administration shall promptly investigate violation of any of the provisions of the Compact. Arkansas River Compact, Art. VIII-H. The Compact further provides that the Administration shall cooperate in the procurement, interchange, compilation, and publication of all factual data bearing upon the administration of the Compact and that state officials "shall furnish pertinent factual data to the Administration upon request." *Id.*, Art. VIII-G(1). Thus, the fact that Colorado may have had control over existing data in Colorado is not an impediment to obtaining such data under the Compact. Likewise, the fact that the Compact Administration requires

unanimous action was not shown to be a problem in obtaining data in this case.

Third, the Master's decision was not based on a finding that the uncertainty in the Kansas analysis of the Program was due to the lack of adequate data. It was based on the fact that the model did not accurately represent storage in and releases from John Martin Reservoir. Report at 328-29.

Finally, the cases cited by Kansas do not support shifting the burden of proof to Colorado or placing the burden of production of data on Colorado. The cases cited by Kansas involve the doctrine of *res ipsa loquitur*, *e.g.*, *Ybarra v. Spangard*, 25 Cal.2d 486, 154 P.2d 687, 689 (1944),[24] or other unique situations where a loss has occurred and the facts are peculiarly within the knowledge of the defendant. *E.g.*, *Commercial Molasses Corp. v. New York Tank Barge Corp.*, 314 U.S. 104, 111 (1941) (bailment). These cases do not support the proposition that the burden of proof or the burden of coming forward with evidence shifts to the defendant anytime the defendant has control over access to certain facts. 2 McCormick on Evidence § 337 at 429 (4th ed. J.W. Strong 1992). Otherwise, the burden of proof and the burden of coming forward with evidence would shift to the defendant in virtually every case. Discovery is the usual method by which a plaintiff obtains facts within the possession of a

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[24] *Ybarra v. Spangard* applied the doctrine of *res ipsa loquitur* in a case where a patient entered a hospital for an appendectomy and, after the operation, developed atrophy of the muscles around the shoulder. These are not, as Kansas asserts, "comparable circumstances." Kansas' Brief at 31.

defendant. Moreover, in this case, the Compact provided a method to obtain data and conduct investigations in the State of Colorado prior to the initiation of this litigation. Arkansas River Compact, Art. VIII-G(1), -H; *see* Colo. Exh. 61 (Report on stock ponds in Colorado prepared by the Engineering Committee of the Compact Administration).

G. Other Arguments by Kansas Are Without Merit

Kansas states: "Common sense leads to the conclusion that putting water on the fields in the heat of summer results in more evaporation and other losses than irrigating fields without crops in the cold of winter." Kansas' Brief at 27. If that were true, one would question why Kansas allowed the Program to begin without objection and why Kansas' experts spent five years to develop the H-I Model to support its claim. The Master noted that the issue is not as simple as Kansas suggests, but is an issue on which testimony by experts is necessary:

> Kansas maintains that storing the winter river flows in reservoirs, and then applying that water to irrigated crops in the summer, uses more water than simply irrigating bare fields in the winter. On first impression, this would seem to be true. . . . However, the issue is much more complex than first appears, and a great deal of highly technical evidence was introduced on the subject. The issue turns largely on the amount of evaporation from bare soil that is assumed during the period when winter irrigation was practiced.

Report at 329.

Kansas also argues that the Master, attempting to apply the preponderance test, in effect "said that it was more likely than not that there were no material depletions of usable flow as a result of the WWSP," Kansas' Brief at 28, a result which Kansas says is "inherently implausible." *Id.* The Master did not conclude that it was more likely than not that there were no material depletions of usable flow; rather, he concluded that, even applying the mere preponderance of the evidence test, Kansas had not proved that the Program had caused material depletions of usable flows in violation of the Compact. Report at 335.

IV. THE MASTER CORRECTLY CONCLUDED THAT THE SPRONK USABLE FLOW METHOD WAS NOT APPROPRIATE TO USE WITH THE H-I MODEL

Finally, Kansas takes exception to the Master's conclusion that the Durbin approach was the best method presented for determining depletions to usable flow. Kansas' Brief at 35-44. Kansas states: "The Master's usable flow method would reduce Kansas' claim by 124,000 acre-feet (25%)." *Id.* at 9. Kansas asserts that the method it proposed, the Spronk method, is the only method consistent with the Compact. *Id.* at 35, 40.

Reading Kansas' Brief, one would never know that the method which the Master concluded was the most appropriate for use with the H-I Model was in fact developed by its own expert, Mr. Durbin, *and originally presented by Kansas to quantify its claim*. Report at 235; RT Vol. 45 at 124-25. The Kansas replacement experts developed a

new usable flow method, but Colorado's experts testified that the new method was not appropriate for use with the H-I Model, and the Master agreed. Report at 303. Thus, the "Master's usable flow method" is nothing more than the usable flow method developed by Mr. Durbin for use with the H-I Model.

During the continuance which the Master granted to allow Kansas to replace Mr. Durbin with other experts due to his hospitalization, Report at 241, the Kansas replacement experts not only modified the coefficients used in the Durbin usable flow method, *id.* at 294-95, but also developed a new usable flow method based on a daily analysis of flows used in Kansas (the "Spronk method"). *Id.* at 300.[25] Colorado's experts objected to the

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[25] Colorado objected vehemently to allowing the replacement experts to use the continuance to redo Kansas' case in this fashion, which was contrary to the order granting the continuance. RT Vol. 88 at 35-38, 40-47; *see* Order Re Kansas Motion for Continuance (Mar. 27, 1991), *printed in* Report-App. at 92 ("This continuance is not granted to allow Kansas, as Colorado fears, 'to redo its case'. . . . Rather, it is intended only to allow Kansas to complete its case, and in particular, to remedy the errors in the model and other exhibits that were identified during cross-examination."). The Master acknowledged that "there was some merit in Colorado's reaction, but in the last analysis I concluded that it was more important to have the best evidence available in the record." Report at 241; RT Vol. 88 at 32. He therefore denied Colorado's motion to exclude the Spronk method and other changes made by the replacement experts to improve Kansas' case. Report at 241. He sought to remedy any prejudice to Colorado by giving Colorado time to prepare cross-examination and to respond to the new evidence as part of its surrebuttal case. *Id.* Because of the lengthy continuance and rulings such as this which were made throughout the trial, giving Kansas the right to present new evidence and new exhibits, Colorado

accuracy of the reconstructed records of flow at Garden City for the 1970-85 period used in the Spronk analysis, *id.*, and to the failure to factor out increased depletions to the flow at Garden City due to post-compact well pumping in Kansas in the 1970s. *Id.* at 304. The Master concluded that the reconstructed records of flow at Garden City were "probably sufficient" for the purpose for which they were used, but agreed that the analysis had not factored out the increased losses in the Arkansas River in Kansas due to increased well development in Kansas. *Id.* at 227, 301, 304-05.[26]

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believes the "clear and convincing" standard should apply to Kansas' claims even if the Court concludes the preponderance standard would otherwise apply to a case for breach of a compact. It is simply not fair to a defendant state, or consistent with the equality of right among states, to allow a plaintiff state to take advantage of the liberal rules allowing full development of the facts in cases between states and then apply a mere preponderance standard. *See* Brief in Support of Colorado's Exceptions at 98 n. 64.

[26] Kansas tries to deflect the Master's finding on this issue by saying that Colorado never established that this concern actually caused the method to give unreasonable results. Kansas' Brief at 43. Kansas states: "It is simply a possibility." *Id.* This is not correct. Mr. Helton demonstrated that the Spronk method over-estimated depletions to usable flows after 1970 because of the increased losses in Kansas. RT Vol. 114 at 186-94; Vol. 115 at 20-22. Kansas also states that "Colorado's counterclaim based on the same allegation of increased pumping, was dismissed by the Master for the reason that Colorado had not proved its case." Kansas' Brief at 43. The Master granted Kansas' motion to dismiss Colorado's counterclaim because Colorado had not shown a "tie-in" between the increased losses in Kansas and any injury to Colorado, not because Colorado had failed to prove the increased losses in Kansas. Report at 454-57.

Colorado's experts also testified that the Spronk method was not appropriate for use with the results of the revised H-I Model because the model was not accurate except on a long-term basis. Report at 303. The Master agreed. *Id.*

Kansas argues, however, that the Durbin method underestimates depletions to usable flow during the period 1975-82. Kansas' Brief at 35. This conclusion does not necessarily follow. The Durbin method calculates depletions to usable flows which are less than the Spronk method during that period, but one cannot conclude from that fact alone that the Durbin method underestimates depletions. One could just as easily conclude that the Spronk method overestimates depletions to usable Stateline flow during that period. Since the monthly percentages used in the Spronk method vary from 0 to 100% depending on a daily analysis of whether the flow crossing the Stateline was being fully used in Kansas, Report at 301-02, it is only appropriate to use that method if the model can predict changes in Stateline flows accurately on a monthly basis. *Id.* at 303. Because the results of the H-I Model are not accurate on that time scale, it is simply not appropriate or reasonable to use that method with the results of the H-I Model. *Id.* at 303-05.

Kansas argues, however, that the Durbin method underpredicts depletions during the 1975-82 period when most flows would have been usable. Kansas' Brief at 40-41. The Master, who heard extensive testimony about the H-I Model and the inaccuracy of the model on a monthly and an annual basis, Report at 303, rejected this argument:

> Kansas argues that applying long-term averages, as Durbin did, underestimates the depletions of usable flow during the late 1970s and early 1980s. That was a period of drought, and according to Kansas most of the low flows were usable. The Spronk analysis was said to correct this inequity. Kansas states that the Spronk methodology gives substantially the same results as the Durbin analysis, except from approximately 1975 to 1982 when the Spronk analysis more properly represents actual hydrologic conditions. . . . However, as Colorado points out, virtually the entire H-I Model is based on average data. . . .
>
> Colorado acknowledges that in theory, at least, there is some validity to the daily approach used by Spronk. . . . However, the Colorado experts testified that the Spronk usable flow method was not appropriate for use with the revised H-I Model. The Spronk analysis assumes that the H-I Model can accurately predict changes of Stateline flow on a monthly basis. RT Vol. 110 at 126-27; RT Vol. 111 at 32, 38-39, 128-29; RT Vol. 115 at 23-24. I believe the objection is sound.

Id. at 302-03 (footnote omitted).

Kansas argued then, as it does now, that the period 1975-82 was a dry period when most of the flow was usable; however, as the Master points out, this argument presumes that the model can accurately predict changes in Stateline flows during this period:

> As the United States notes, the fact that virtually all flows during a dry period may be usable does not "carry this argument." RT Vol. 142 at 48. The more fundamental question is

> what the Stateline flows and depletions were before usability criteria were applied.

Report at 302 n. 129.[27]

The Kansas replacement experts corrected errors and poor assumptions in the original H-I Model, but did not change the basic logic or structure of the model. As the Master states:

> Although the H-I Model was improved by Kansas' replacement experts, the fundamental structure of the model was not changed. Durbin's testimony shows that the model was originally designed to predict changes in Stateline flows. In his opinion, the model was a "good predictor" when "looking at long periods of time." RT Vol. 51 at 72. Using "a long-term average," he testified that the model predicted actual Stateline flows with a "fair degree of accuracy." *Id.* at 84. If multi-year periods were averaged, Durbin said "there would begin to be more and more correspondence between the model and what was actually observed." RT Vol. 44 at 86.

Report at 303 n. 130. Mr. Schroeder, Colorado's modeling expert, testified at length as to why the revised H-I Model could not accurately predict changes in Stateline flow on a monthly or an annual basis, one reason being that

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[27] The Master describes some of the extensive testimony and evidence on the inaccuracy of the revised H-I Model. Report at 303-04. If the Court has any question about the Master's findings on this issue, we urge the Court to examine the exhibits and the testimony cited by the Master. For a comparison of the actual, observed Stateline flows and the Stateline flows predicted by the revised H-I Model, see Colo. Exh. 908.

Kansas' demands for releases from John Martin Reservoir are predicted on the basis of calibrated numbers that do not vary from year to year and do not take into account weather or crop conditions in Kansas. Report at 263 n. 102; RT Vol. 111 at 23-39.

Kansas' argument that the "plain meaning" of Article IV-D "excludes the notion of averaging over multi-year periods," Kansas' Brief at 38, if correct, is fatal to its entire case. The H-I Model was not designed to be accurate on a daily or monthly basis and relied on averages. Report at 303 n. 130. Kansas states that "this court and the compacting states have recognized the need to assess the usability of flows on a daily basis to the maximum extent possible." Kansas' Brief at 39. If that is correct, then it follows that *depletions* to usable flows should have been assessed on a daily basis to the maximum extent possible. As Colorado demonstrated, and as the Master found, the H-I Model was based on averages and could not accurately predict changes of Stateline flow on a monthly or annual basis. Report at 302-03. The structure of the model, and the data used in the model, were such that it was only a good predictor looking at long periods of time. *Id.* at 303 n. 130. Therefore, if Article IV-D excludes the notion of averaging, Kansas' claims should be dismissed on that basis.

Finally, the very premise of Kansas' argument ignores the fact that John Martin Reservoir regulates the water supply for ditches in Kansas. Thus, the importance of daily usability expressed in *Colorado v. Kansas*, 320 U.S. at 396-98, has been significantly lessened for water users in Kansas because John Martin captures flood flows and regulates the water supply for ditches in Kansas when

there is water in the conservation pool. In addition, virtually all of the farmers under ditches in Kansas who use surface water also use wells to supplement surface supplies. Jt. Exh. 105 at 112, 130. If Stateline flows are reduced, water users in Kansas simply pump additional water. If Stateline flows are then increased, they pump less water. Thus, the concern about daily usability expressed in *Colorado v. Kansas*, 320 U.S. at 396-98, has been significantly reduced for water users in Kansas with construction of John Martin Reservoir and the use of wells to supplement surface supplies.

V. CONCLUSION

Kansas' exceptions to the Special Master's Report should be denied:

1. The Master correctly concluded that Kansas' evidence did not prove that the operation of the Trinidad Project had violated the Compact.

2. The Master correctly concluded that Kansas had failed to prove that the operation of the Winter Water Storage Program had violated the Compact.

3. The Master correctly concluded that the Spronk usable flow method was not appropriate for use with the results of the H-I Model.

Respectfully submitted,

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No. 105, Original

In The

Supreme Court of the United States

October Term, 1985

STATE OF KANSAS,

Plaintiff,

v.

STATE OF COLORADO,

Defendant,

UNITED STATES OF AMERICA,

Defendant-Intervenor.

APPENDIX TO COLORADO'S REPLY BRIEF

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Appendix Item 1

Excerpt from Transcript of Proceedings Held Before
Arthur L. Littleworth, Special Master, pages 39-40

September 28, 1988

MR. SIMMS:

* * *

WE BELIEVE THAT THAT ROLLOVER CONTRAVENES BOTH THE OPERATING STUDIES, THE OPERATING PRINCIPLES, THE MODEL TRANSFER DECREE, CONDITION THREE OF THE KANSAS AMENDMENTS TO THE OPERATING PRINCIPLES AS WELL AS THE ARKANSAS RIVER COMPACT.

SPECIAL MASTER: NOW, LET ME JUST STOP YOU THERE FOR A SECOND.

IT CAN VIOLATE ALL OF THOSE THINGS THAT YOU HAVE SAID BUT YOUR COMPLAINT IN THIS CASE IS THAT THIS IS ONE OF THE THINGS THAT ULTIMATELY RESULTED IN A MATERIAL DEPLETION OF THE STATE LINE. SO THAT IS – WHEN YOU FINALLY GET DOWN TO WHAT YOU HAVE GOT TO SHOW, WHETHER OR NOT IT IS IN ACCORD WITH THESE VARIOUS THINGS IS NOT REALLY WITHIN YOUR COMPLAINT, IS IT? ARE WE STILL LOOKING AT WHETHER OR NOT THERE HAS BEEN A MATERIAL DEPLETION CAUSED BY THOSE OPERATIONS?

MR. SIMMS: THAT IS THE ULTIMATE PROBLEM. I THINK WHETHER OR NOT IT VIOLATES ALL OF THE OTHER ITEMS THAT I MENTIONED HAS A BEARING ON THE LEGAL RESOLUTION OF THAT PROBLEM. BUT AS A MATTER OF FACT –

SPECIAL MASTER: YOU HAVEN'T PLEAD A CASE WHICH HAS ASKED ME TO DETERMINE WHETHER OR NOT IT HAS VIOLATED A WHOLE LOT OF OTHER EARLIER DECREES; IS THAT RIGHT?

MR. SIMMS: THAT IS CORRECT.

Appendix Item 2

Section 1(a)-(c) of the Flood Control Act of 1944
33 U.S.C. §701-1 (1988)

§ 701-1. Declaration of policy of 1944 Act

In connection with the exercise of jurisdiction over the rivers of the Nation through the construction of works of improvement, for navigation or flood control, as herein authorized, it is hereby declared to be the policy of the Congress to recognize the interests and rights of the States in determining the development of the watersheds within their borders and likewise their interests and rights in water utilization and control, as herein authorized to preserve and protect to the fullest possible extent established and potential uses, for all purposes, of the waters of the Nation's rivers; to facilitate the consideration of projects on a basis of comprehensive and coordinated development; and to limit the authorization and construction of navigation works to those in which a substantial benefit to navigation will be realized therefrom and which can be operated consistently with appropriate and economic use of the waters of such rivers by other users.

In conformity with this policy:

(a) Plans, proposals, or reports of the Chief of Engineers, Department of the Army, for any works of improvement for navigation or flood control not heretofore or herein authorized, shall be submitted to the Congress only upon compliance with the provisions of this paragraph (a). Investigations which form the basis for any such plans, proposals, or reports shall be conducted in such a manner as to give to the affected State or States, during the course of the investigations, information developed by the investigations and also opportunity for consultation regarding plans and proposals, and, to

the extent deemed practicable by the Chief of Engineers, opportunity to cooperate in the investigations. If such investigations in whole or part are concerned with the use or control of waters arising west of the ninety-seventh meridian, the Chief of Engineers shall give to the Secretary of the Interior, during the course of the investigations, information developed by the investigations and also opportunity for consultation regarding plans and proposals, and to the extent deemed practicable by the Chief of Engineers, opportunity to cooperate in the investigations. The relations of the Chief of Engineers with any State under this paragraph (a) shall be with the Governor of the State or such official or agency of the State as the Governor may designate. The term "affected State or States" shall include those in which the works or any part thereof are proposed to be located; those which in whole or part are both within the drainage basin involved and situated in a State lying wholly or in part west of the ninety-eighth meridian; and such of those which are east of the ninety-eighth meridian as, in the judgment of the Chief of Engineers, will be substantially affected. Such plans, proposals, or reports and related investigations shall be made to the end, among other things, of facilitating the coordination of plans for the construction and operation of the proposed works with other plans involving the waters which would be used or controlled by such proposed works. Each report submitting any such plans or proposals to the Congress shall set out therein, among other things, the relationship between the plans for construction and operation of the proposed works and the plans, if any, submitted by the

affected States and by the Secretary of the Interior. The Chief of Engineers shall transmit a copy of his proposed report to each affected State, and, in the case the plans or proposals covered by the report are concerned with the use or control of waters which rise in whole or in part west of the ninety-seventh meridian, to the Secretary of the Interior. Within ninety days from the date of receipt of said proposed report, the written views and recommendations of each affected State and of the Secretary of the Interior may be submitted to the Chief of Engineers. The Secretary of the Army shall transmit to the Congress, with such comments and recommendations as he deems appropriate, the proposed report together with the submitted views and recommendations of affected States and of the Secretary of the Interior. The Secretary of the Army may prepare and make said transmittal any time following said ninety-day period. The letter of transmittal and its attachments shall be printed as a House or Senate document.

(b) The use for navigation, in connection with the operation and maintenance of such works herein authorized for construction, of waters arising in States lying wholly or partly west of the ninety-eighth meridian shall be only such use as does not conflict with any beneficial consumptive use, present or future, in States lying wholly or partly west of the ninety-eighth meridian, of such waters for domestic, municipal, stock water, irrigation, mining, or industrial purposes.

(c) The Secretary of the Interior, in making investigations of and reports on works for irrigation and purposes incidental thereto shall, in

relation to an affected State or States (as defined in paragraph (a) of this section), and to the Secretary of the Army, be subject to the same provisions regarding investigations, plans, proposals, and reports as prescribed in paragraph (a) of this section for the Chief of Engineers and the Secretary of the Army. In the event a submission of views and recommendations, made by an affected State or by the Secretary of the Army pursuant to said provisions, sets forth objections to the plans or proposals covered by the report of the Secretary of the Interior, the proposed works shall not be deemed authorized except upon approval by an Act of Congress; and section 485h(a) of title 43 [subsection 9(a) of the Reclamation Project Act of 1939 (64 Stat. 1187)] and section 590z-1(a) of title 16 [section 3(a) of the Act of August 11, 1939 (53 Stat. 1418), as amended] are amended accordingly.

(Act of Dec. 22, 1944, ch. 665, §1, 58 Stat. 887.)

Appendix Item 3

Excerpt from
A. Golze, *Reclamation in the United States* (1961)

> Again, in 1939, Congress recognized the difficulty of financing the large and expensive multiple-purpose projects under the rigid terms of the earlier Acts. It modified the rules of feasibility for multiple-purpose projects by recognizing benefits that were national in character, such as flood control and navigation, to be nonreimbursable. It further met the problem of anticipated higher cost of irrigation projects beyond the ability of the water users to pay, by providing for a credit of power revenues to irrigation when such revenues were excess to the cost of repaying the investment in power facilities. Under the 1939 Act the Secretary of the Interior was given back the power to make a finding of feasibility, which had rested with the President since 1910.
>
> The 1939 Act is the law under which reports for authorization (or findings of feasibility) are prepared. While the Secretary of the Interior has authority to find a project feasible and therefore authorized, if it meets the requirements of the Act, most projects have actually been authorized by special Acts of Congress, based on reports submitted by the Secretary. . . .

A. Golze, *Reclamation in the United States* 125 (1961).

Appendix Item 4

Excerpts from Jt. Exh. 3

Record of Twelfth Meeting
Colorado-Kansas Arkansas River Compact Commission
February 3, 4, 5, and 6, 1948

> Chairman Kramer stated that the Administration should not be vested with anything in the nature of police powers or powers to take any physical action such as requiring the shutting of gates or the padlocking of gates or any type of action that the water commissioner or State Engineer might be authorized to take; that he did not envision the Administration as a quasi-judicial or police body; that the corollary to that is, where something came to the attention of the Administration that required corrective action, the same should properly be referred to the officials or agencies of the state which were empowered to act on such complaint.

Record at 12-48.

> Attorney General Hinkley [of Colorado] offered the following quotation for the consideration of the Commission.
>
> > "Consideration should be given to the conclusion of the National Reclamation Association's Committee on the integrity of state water law that the granting of judicial functions to a compact administrative commission is questioned. It is doubtful that a compact could create a judicial body to disburse on an interstate stream within the political and legal concepts of the federal and state constitutions. The primary obligation to abide by the terms of a compact rests upon the constituted authorities of the signatory states. This involves a determination by the officials of each state of the interpretation of its terms. Controversies among the states on the issue of alleged failure to comply with the terms of a compact or on a

> question of their interpretation must be resolved by appropriate action in the Supreme Court of the United States. Therefore, a compact Commission's powers must be limited to those of an administrative character, and such powers for the purpose of enforcement cannot supersede, expressly or by implication, those of the constituted state authorities, whose action in this respect, of course, is subject to review by the United States Supreme Court. Failure of State officials to accept the findings of a compact Commission and to comport with the rules set up by such a body for the purpose of the administrative functions may constitute an issue of compact violation."
>
> Mr. Hinkley stated that he had such a matter in mind in connection with work that was being done on the Colorado River and that the quoted proposal was tentatively suggested; that findings of fact by the Commission should not be conclusive in any court or tribunal which might be called upon to interpret or enforce the Compact.

Id. at 12-52 to 12-53.

Appendix Item 5

Excerpt from Jt. Exh. 3

Record of Sixteenth Meeting
Colorado-Kansas Arkansas River Compact Commission
November 8, 9, and 10, 1948

Chairman Kramer directed the attention of the Commission to a passage in the June 1948 report of the Bureau of Reclamation on the Gunnison-Arkansas Project. He noted that such was a preliminary draft of the proposed report; that it contained a chapter on water compacts; that one pertinent paragraph relating to functions in the proposed Compact read: "The waters passing the eastern boundary of Colorado are also subject to compact. No agreement has been reached, however, between the States of Colorado and Kansas upon the allocation of Arkansas River water to each of the two states. It is felt that the Colorado-Kansas Compact will not be inimical to the Gunnison-Arkansas Project; "that this matter was being cited and placed on the record so that there would be no question but that this Commission had cognizance of the development of the Gunnison-Arkansas project; that is [sic] relationship to the Arkansas River Compact which was being negotiated, had been recognized; that the report was dated June 1948, at which time the crystallization of the present Compact had not taken place. He inquired if there was any doubt in any Commissioner's mind that this Compact as of this date would be in any way inimical to the Gunnison-Arkansas Project. Commissioners Vidal and Ireland replied they knew of none. Commissioner Knapp stated that he did not want to answer yes or no because he had not read the report.

Record at 16-78 to 16-79.

Appendix Item 6

Excerpt from Colo. Exh. 643

Interim Report
Gunnison-Arkansas Project, Colorado,
Project Planning Report No. 7-8a.49-0 (June 1948)

Water supply

51. Based upon hydrologic studies, an average of 60,000 acre-feet each year could have been diverted from the Fryingpan River to the Eastern Slope during the 34-year period 1911-1944. Facilities provided by the Initial Development would enable the storage of an additional 30,000 acre-feet of water annually from the existing Independence Pass (Twin Lakes) Diversion, and an additional 2,000 acre-feet from the Wurtz Ditch Diversion. Excess flood flows of the Arkansas River amounting to about 5,000 acre-feet each year could also be stored. Winter flows of the Arkansas River, averaging 97,000 acre-feet before deduction of losses, are now used for winter irrigation. Providing the water users are agreeable, which seems likely, the storage of that water would enable a more beneficial use during the ensuing irrigation season. Thus, upward of 194,000 acre-feet less losses of streamflow each year could be conserved or converted to more beneficial use by the Initial Development. That annual flow, combined with holdover storage and return flows, would provide much of the water supply needed to alleviate the 1911-1944 average shortage of 36 percent of the estimated ideal headgate diversion requirements encountered by lands between Pueblo and the Colorado-Kansas boundary.

Report of the Regional Director at 12.

JAN 3 1995

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In The

SUPREME COURT OF THE UNITED STATES
October Term, 1994

STATE OF KANSAS,
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v.

STATE OF COLORADO,
Defendant,

and

UNITED STATES OF AMERICA,
Defendant-Intervenor.

ON EXCEPTIONS TO THE 1994 REPORT OF THE SPECIAL MASTER

KANSAS' REPLY BRIEF OPPOSING COLORADO'S EXCEPTIONS

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January 3, 1995

RESTATEMENT OF QUESTION PRESENTED

Colorado states the first of its Questions Presented as follows:

> 1. Whether the defense of laches is applicable against a state in a controversy between states in this Court.

The question should be stated as follows:

> 1. Whether the defense of laches is applicable against a state seeking to enforce an interstate compact in this Court.

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KANSAS' REPLY BRIEF OPPOSING COLORADO'S EXCEPTIONS

OBJECTIONS TO COLORADO'S STATEMENT OF THE CASE

There are several incorrect statements or implications in Colorado's Statement of the Case (Colo. Brief at 2-24).[1] The most significant mistakes are noted below.

In the opening paragraphs of Colorado's Statement of the Case, Colorado asserts that "the Master found that Kansas knew or should have known of the effects of post-compact well pumping in Colorado by 1968 . . . ." Colo. Brief at 3. This statement is not true. The critical distinction is between knowledge of the

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[1] Colorado's Brief In Support of Colorado's Exceptions, filed November 17, 1994 in this proceeding, will be referred to as "Colo. Brief at __"

existence of postcompact well pumping and knowledge of the *effects of pumping on usable stateline flows*. The Master's conclusion on this point was as follows: "The extent of postcompact well pumping in Colorado was not generally known until approximately 1968, and there is no substantial evidence that Kansas knew or should have known about the effect of such well development before that time." Rep. vol. I at 169.[2] The Master went on to state: "By the 1970s the extent of pumping in Colorado was a matter of common knowledge, but that is not to say that the impact of such pumping on usable Stateline flows was generally known or understood. Indeed, it appears not to have been, even in Colorado." *Id.* This statement refutes the Colorado assertion. Under Article IV-D of the Compact, postcompact wells and pumping and increased pumping by precompact wells are not prohibited per se; rather, such pumping is prohibited only to the extent that the *effect* of such pumping is to materially deplete the waters of the Arkansas River in usable quantity or availability for use to the water users in Colorado and Kansas. Arkansas River Compact ("Compact"), Art. IV-D, Rep. App., Ex. 1 at App. 5.

Colorado asserts that "According to a careful study made by Colorado, Report at 204, there are 717 large-capacity . . . wells in Colorado . . . with appropriation dates earlier than 1950." Colo. Brief at 8. On the contrary, Colorado did not do a careful study of pre-1950 wells. The cited reference in the Master's Report does not refer to pre-1950 wells. That statement appears in the "Postcompact Pumping in Colorado" section of the Master's Report. *See* Rep. vol. II at 201. The assignment of priority dates was not carefully done by Colorado. In fact, Colorado simply accepted the priority dates claimed by the well owners themselves in uncontested Colorado water court filings, some of which admittedly contain false claims. Rep. vol. II at 191 & n.64. R. vol. 131 at 22, Pl. Reply App., Item 19; vol. 84 at 24-26, Pl. Reply App., Item 16. Finally, "pre-1950" is not the same as "precom-

---

[2] The Master's Report, ordered filed October 3, 1994, 115 S.Ct. 48 (1994), will be referred to as "Rep. vol. _____ at _____"

pact". The Compact was concluded by the negotiators on December 14, 1948. It was ratified by the states and consented to by Congress in the spring of 1949. Act of Congress of May 31, 1949, 63 State. 145; 1949 Kan. Sess. Laws 829; 1949 Colo. Sess. Laws 485. The approvals by the state legislatures and Congress ratified the agreement of the negotiators, which included the agreement to protect users existing at the time of the agreement, December 14, 1948. *See* Rep. vol. I at 99-102, 107.

Colorado also implies in its Statement of the Case that the increase in irrigated acreage in Kansas by virtue of increased pumping of the Ogallala Aquifer in Kansas should absolve Colorado of responsibility for its violations of the Arkansas River Compact. *See* Colo. Brief at 9-13. On the contrary, pumping in Kansas is relevant only if it affects Colorado water users, and there is no evidence that the declining levels in the Ogallala Aquifer have caused Colorado to be deprived of any Arkansas River Water; rather, the reductions of stateline flows by Colorado has hastened groundwater declines in Kansas. Jt. Ex. 139 at 55 (R. vol. 30 at 35, 75, 76), Pl. Reply App., Item 10.

Colorado attempts to conceal the apportionment of the Arkansas River accomplished by the Arkansas River Compact, saying:

> The Compact does not apportion the waters of the Arkansas River between Colorado and Kansas based on beneficial consumptive use or a Stateline delivery obligation, as in some other interstate water compacts, but instead gives both states the right to make demands for releases from John Martin Reservoir at the times and at the rates specified in the Compact. Colo. Brief at 15.

Colorado would like to limit the Compact to "the right to make demands for releases from John Martin Reservoir." The truth is that the Compact sought to and did achieve much more than that. Article I-B of the Compact makes this clear:

The major purposes of this Compact are to:

• • • •

> B. *Equitably divide and apportion between the States of Colorado and Kansas the waters of the Arkansas River* and their utilization *as well as* the benefits arising from the construction, operation and maintenance by the United States of John Martin Reservoir Project for water conservation purposes. Rep. App., Ex. 1 at App. 2 (emphasis added).

The Master found that this purpose had been achieved. Rep. vol. I at 107. He said, "The apportionment in the compact includes the normal flows of the river, as well as a division of the benefits associated with the conservation pool in John Martin Reservoir." *Id.* The apportionment of the normal flows of the river was accomplished by including the critical proviso in Article IV-D concerning future development or construction:

> Provided, that the waters of the Arkansas River, as defined in Article III, shall not be materially depleted in usable quantity or availability for use to the water users in Colorado and Kansas under this Compact by such future development or construction.

Thus, the apportionment achieved by the Compact was not limited to division of the benefits of John Martin Reservoir.

In the same vein, Colorado maintains that the philosophy of "live and let live" should apply to future developments in the basin under the Compact. Colo. Brief at 15-16 & n.17. If accepted, this phrase could reduce the Compact to a useless gesture. The Master rejected the Colorado position. *See* Rep. vol. I at 106. Colorado's position is based on two documents, both of which are dated some years after the adoption of the Compact.

They report the use by Hans Kramer[3] of the phrase "live and let live." Gen. Kramer made no mention, so far as we are aware, of "live and let live" during the negotiation of the Compact or in the hearings before Congress in 1949 concerning congressional consent to the Compact.

After-the-fact statements by a person involved in the legislative process, as Gen. Kramer was in the drafting of the Compact, are accorded no probative weight in ascertaining the intent of the legislation. *Bread Political Action Comm. v. Federal Election Comm'n*, 455 U.S. 577, 582 n.3 (1982); *Petry v. Block*, 697 F.2d 1169, 1171 (CADC 1983). Moreover, even legislative history should not be resorted to if the wording of the legislation is itself plain. *See, e.g., Negonsott v. Samuels*, 113 S. Ct. 1119, 1122-23 (1993), *Reves v. Ernst & Young*, 113 S. Ct. 1163, 1169 (1993). The language of Article IV-D is plain. Therefore, these after-the-fact statements cited by Colorado to weaken that language are not admissible.

The first document referred to by Colorado is a letter of April 10, 1951 from Gen. Kramer to the Corps of Engineers explaining why no engineering reports were finalized and released to the public in the course of the negotiations of the Compact:

> However, even before the date of the Second Interim [Engineering] Report, the trend of the negotiations took a decided turn away from the concept of fixed operating conditions based on firm interstate allocations toward the more flexible philosophy, best described as "live and let live," which became the basis of the ultimate Compact. That principle, which was an outgrowth of the Interim Executive Agreement be-

[3] Kramer was the federal representative and chairman of the commission that negotiated the Arkansas River Compact and later served in the same capacities on the Arkansas River Compact Administration. He was a retired Brigadier General with the U.S. Army Corps of Engineers. Rep. vol. I at 91.

> tween Colorado and Kansas governing the operation of John Martin Reservoir during the period of compact negotiations, permitted either State to obtain water from John Martin Reservoir (when stored water was available) without regard to the other State and without the need for keeping books to balance hypothetical debits and credits. Def. Ex. 57 at 2 (R. vol. 12 at 7), Pl. Reply App., Item 3.

The Master concluded that these remarks related only to the conservation pool in John Martin and the ability of both states to draw upon it according to need, not to the Compact as a whole. Rep. vol. I at 106. The language quoted clearly supports the Master's conclusion. The language in Gen. Kramer's letter also expresses the purpose of the negotiators to maintain the status quo. *See* Kansas' Brief In Support of Exceptions at 5; Rep. vol. I at 107. If specific inflow-outflow requirements with index gages had been adopted, engineering studies would have been necessary, and there was the possibility that some existing uses might occasionally have been curtailed. Instead, the Compact negotiators adopted the Article IV-D proviso protecting existing uses from material depletions of usable flow. This compacting approach left to later enforcement actions, such as this one, the necessity of quantifying any departure from the status quo in 1948.

The second document to which Colorado refers for Gen. Kramer's use of the phrase "live and let live" is a set of minutes of the Arkansas River Compact Administration. The phrase occurs in the context of a discussion of materiality. Both state delegations to the Compact Administration, including persons who had earlier represented the states in the Compact negotiations,[4] having heard

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[4] The members of the Compact Administration who had served on the Compact Commission which negotiated the Compact were Mendenhall from Colorado and Leavitt and Tate from Kansas. *See* Rep. vol. I at 91-92; Jt. Ex. 19, Minutes of Dec. 14, 1954 meeting, at 11-14 (R. vol. 17, at 87, 88), Pl. Reply App., Item 6.

Gen. Kramer's presentation on materiality, including his use of the phrase "live and let live," voted to reject the General's position. Jt. Ex. 19, Minutes of Dec. 14, 1954 meeting at 11-14 (R. vol. 17 at 87, 89), Pl. Reply App., Item 6.

For all of the foregoing reasons, Colorado's suggestion that the mandatory terms of the Compact be relaxed based on after-the-fact statements by Gen. Kramer should be rejected in favor of the primary source for determining the intent of Article IV-D, the language of Article IV-D itself.

SUMMARY OF ARGUMENT [5]

It is important to note at the outset that nowhere in its exceptions or supporting brief does Colorado deny that it has violated the Arkansas River Compact by virtue of increased postcompact pumping in Colorado over the period 1950-85. Colorado's arguments on laches, precompact pumping, the 1980 Operating Plan and the burden of proof do not question the existence of that violation.

I. Laches.

Even if the facts of this case would support the defense of laches, which they do not, the defense of laches is generally inapplicable against a state in an interstate controversy, as a matter of law. *Illinois v. Kentucky*, 500 U.S. 380, 388 (1991). Moreover, because equitable doctrines such as laches are particularly inconsistent with the precedents of the Court in interstate compact enforcement proceedings, Kansas has restated Colorado's first question presented accordingly. Colorado insists that there should be essentially no remedy for past breaches of the Compact because it had no reason to believe it would be sued. Colorado relies

[5] This brief is organized to track as closely as possible the Brief in Support of Colorado's Exceptions. Parts III and IV of the Argument in this brief correspond, however, to Parts IV and V of the Colorado Brief because there is no Part III in the Colorado Brief.

in this regard on the specialized rules tailored for equitable apportionment cases such as *Colorado v. Kansas*, 320 U.S. 383 (1943). While equitable considerations are central in equitable apportionment cases, they are out of place in compact enforcement cases. *See, e.g., Texas v. New Mexico*, 462 U.S. 554 (1983); 482 U.S. 124 (1987); *Oklahoma v. New Mexico*, 501 U.S. 221 (1991).

If, *arguendo*, laches is available as a matter of legal theory to Colorado, the facts in this case do not show inexcusable delay that would give rise to laches. In fact, there was no delay at all. Colorado claims that Kansas knew or should have known of well development in Colorado. The existence of well development in Colorado is not the question, however. The question is whether Kansas as a state can be charged with knowledge of the *effects* of postcompact well pumping on usable stateline flows as governed by Article IV-D of the Arkansas River Compact. There is no evidence that Kansas was aware of Compact violations. Indeed, Colorado steadfastly denied that there could be any such effects as late as the eve of the filing of this litigation. In addition, Colorado asserted that there was not even any need to investigate such effects. *See* Jt. Ex. 32 at 23 (R. vol. 14 at 12, 22, 26), Pl. Reply App., Item 7.[6] If Colorado believed there was no need to investigate such effects, it is hard to understand how Colorado can now assert that Kansas had for many years a duty to investigate those same effects.

II. Precompact Pumping.

The Master correctly rejected Colorado's excessive claim for a right to almost 50,000 acre-feet per year of pumping by precompact wells. This figure was not based on estimates of actual precompact pumping but on calculations assuming that uncontested filings in Colorado water court were correct and that Col-

[6] "Pl. Reply App., Item _____" refers to material in the Appendix to this brief.

orado had a right to expand the use of precompact wells up to their claimed capacities. Rep. vol. II at 182-83. The Master determined that the highest annual amount pumped during the Compact negotiations would be the limit of Colorado's precompact entitlement. Rep. vol. I at 190-200. The U.S. Geological Survey (USGS) reported that the highest amount actually pumped during the negotiations of the Compact was 15,000 acre-feet per year. Kansas, which relied in part on the USGS findings, found that the highest amount actually pumped in the study area for this case during the Compact negotiations was 11,000 acre-feet per year.

The fundamental issues are (1) whether Article IV-D limits the Colorado entitlement to the amount actually pumped at the time of the Compact negotiations and (2), if so, what that amount was. Article IV-D permits Colorado to continue the actual groundwater pumping that was occurring at the time of the negotiation of the Compact, but does not allow Colorado to "improve or prolong the functioning"[7] of those precompact wells if to do so would violate the proviso of Article IV-D. The Master embraced the Kansas legal position on precompact pumping. The Master did not accept the Kansas figures for the maximum precompact pumping of 11,000 acre-feet per year, however. Instead, he endorsed the figure of 15,000 acre-feet per year determined by the USGS and accepted over the last several decades by the USGS and by all three branches of the Colorado State government.

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[7] The exact words of Article IV-D, "the improved or prolonged functioning of existing works" includes any increase in the pumping of precompact wells beyond the precompact volumes pumped. Rep. vol. I at 108, vol. II at 194.

III. The 1980 Operating Plan.

The Master rejected Colorado's claim that benefits received by Kansas, under a resolution of the Compact Administration known as the 1980 Operating Plan for John Martin Reservoir, should offset violations of the Compact by Colorado. The Master found that the benefits accruing to both states from the 1980 Operating Plan were separately bargained for and should not be offset against compact violations. The 1980 Operating Plan was not intended to have the effect claimed by Colorado, as shown by its own provisions and the fact that long afterward Colorado was still denying that there were any depletions caused by postcompact well pumping in Colorado. Colorado was not admitting that there were Compact violations due to postcompact well pumping in Colorado in 1980, nor even in 1985 on the eve of the filing of this litigation.

IV. Standard of Proof.

Colorado claims that Kansas should be required to prove a breach of the Compact by clear and convincing evidence. This position was carefully analyzed by the Master and correctly rejected. Colorado's position relies on the misconception that this case is an equitable apportionment case. The Court recently stated in *Nebraska v. Wyoming*, 113 S. Ct. 1689, 1694-96 (1993), that the clear and convincing standard applies only to the initial establishment of an equitable apportionment and not to the enforcement thereof. Colorado does not claim that Kansas is seeking a new equitable apportionment in this case. It must admit that this is indeed a compact enforcement case.

An unusually high burden of proof thwarts the enforcement of a federal statute, namely, the Compact, and would promote irresponsibility on Colorado's part. Colorado consistently cites equitable apportionment cases in making its argument. It also suggests that a higher burden of proof is required because of the seriousness of the issues involved in interstate cases. Kansas

agrees that the issues are serious, but raising the burden of proof is not a proper response to that fact. Placing an unusually high burden of proof on the plaintiff makes it more likely that a defendant state can violate a compact with impunity. The higher burden of proof is inconsistent with the purposes of the Compact Clause and with the Court's recommendation to Kansas and Colorado in its 1943 decision, of the compacting process under Article I, Section 10, Clause 3 of the Constitution as the preferred alternative to equitable apportionment litigation. *See Colorado v. Kansas*, 320 U.S. 383, 392 (1943).

ARGUMENT [8]

I. Laches Should Not Bar Kansas' Claim for Damages.

Colorado asserts in its Exceptions a position that it has not asserted previously in this litigation. *See* Colo. Brief at 24-64. In fact, this is the third distinct position Colorado has taken on laches since the close of trial. Colorado initially took the position that Kansas should not be entitled to relief for well development which took place prior to 1965. *See* Colorado's Closing Brief re Kansas' Well Claim at 44, 48, Pleading Index Tab No. 383,[9] Pl. Reply App., Item 20. Colorado's position was that Kansas should be barred from all relief, both past damages and future remedies, for Compact violations caused by wells drilled prior to 1965 (later changed to 1966). Colorado was asking the Court to forever "grandfather" over 90% of all postcompact wells in Colorado.[10]

When the Master indicated that he intended to reject Colorado's position on laches, Colorado limited its position to a claim

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[8] Kansas does not concede any argument made in support of Colorado's exceptions even if not specifically addressed in this brief.

[9] "Pleading Index Tab No. _____" refers to the Pleading Index enclosed with Special Master Littleworth's letter of August 2, 1994 to Francis J. Lorson, Chief Deputy Clerk.

[10] Table 1, Pl. Ex. 30 (R. vol. 21, at 117, vol. 22, at 21, 30), Pl. App., Item 1 shows 849 wells in 1948, 2,377 wells in 1965 and 2,543 wells in 1985.

that laches should bar Kansas' well claim only as to damages for pumping which occurred up to 1975. Colorado's Memorandum Re Matters to Be Raised at Oral Argument at 2, 4-5, 52, Pleading Index Tab No. 421, Pl. Reply App., Item 21. The Master, however, rejected both positions:

> I conclude, therefore, that Kansas has not been guilty of inexcusable delay in making its well claim, and that Colorado has not been prejudiced by Kansas' failure to press its claim earlier. Kansas should not be barred by laches or any other equitable defense, including acquiescence, from obtaining relief based on its well claim. In reaching these conclusions, I have fully considered the Court's statement in *Colorado v. Kansas*, 320 U.S. 383 at 394, that unjustified delay must "gravely add" to the plaintiff's burden and be weighed in considering the equities of the case. Rep. vol. I at 170.

Now Colorado has taken yet a third, more expansive position, namely, that Kansas should be barred from all relief for Compact violations by Colorado up to the year in which this litigation was initiated. Colo. Brief at 23, 63. The new Colorado position would essentially deny Kansas any remedy for past breaches of the Compact by Colorado. In *Texas v. New Mexico*, 482 U.S. 124 (1987), this Court rejected a similar argument:

> We find no merit in [New Mexico's] submission that we may order only prospective relief, that is, requiring future performance of compact obligations without a remedy for past breaches. If that were the case, New Mexico's defaults could never be remedied. . . . There is nothing in the nature of compacts generally or of this Compact in particular that counsels against rectifying a failure to perform in the past as well as

> ordering future performance called for by the Compact. 482 U.S. at 128.

Acceptance of Colorado's position would also encourage states such as Colorado to violate interstate compacts because there would be no disadvantage to doing so.

A. Laches Should Rarely, if Ever, Be Applied Against A State Seeking To Enforce an Interstate Compact.

Colorado begins its argument on laches by arguing that states appearing before the U.S. Supreme Court under its original jurisdiction should be treated like foreign sovereigns and thus denied the normal protection a state enjoys against laches. Colo. Brief at 27-29. This is a novel argument indeed, especially in light of the Court's recent statement in an original-jurisdiction case (relying on the case cited by Colorado) that "the laches defense is generally inapplicable against a State." *Illinois v. Kentucky*, 500 U.S. 380, 388 (1991), *citing Guaranty Trust Co. v. United States*, 304 U.S. 126 (1938). The very case upon which Colorado relies for its argument, *Guaranty Trust*, makes clear that the ruling in that case—that the statute of limitations runs against a foreign government—does not apply to state governments appearing in federal court. In *Guaranty Trust*, the United States had brought suit against Guaranty Trust to recover a deposit of the Russian government of which the United States was the assignee. Guaranty Trust asserted the statute of limitations as a defense. The Court analyzed the underlying policies as follows:

> The rule quod nullum tempus occurrit regi—that the sovereign is exempt from the consequences of its laches, and from the operation of statutes of limitations—appears to be a vestigial survival of the prerogative of the Crown. But whether or not that alone accounts for its origin, ... it is . . . *equally applicable to all governments*." . . . So complete has been

> its acceptance that the implied immunity of the *domestic "sovereign," state or national*, has been universally deemed to be an exception to local statutes of limitations where *the government, state or national*, is not expressly included . . . . 304 U.S. at 132-33 (emphasis added) (citations omitted).

Thus, the Court makes clear, in the very opinion upon which Colorado relies, that domestic sovereigns, including states, enjoy the protection of the rule of *nullum tempus*.

The Colorado argument misses much of the Kansas position on laches. It is not only the status of the parties as states that bars laches, but also the type of proceeding in which Kansas and Colorado are currently involved, namely the enforcement of a federal statute, the Arkansas River Compact. Colorado cites only one interstate water allocation case to support its argument—*Colorado v. Kansas*, 320 U.S. 383, 394 (1943). That case was an equitable apportionment case in which equitable doctrines were generally appropriate. Colorado could not cite a compact enforcement case recognizing laches, because there is none. Colorado is thus asking this Court to apply for the first time the doctrine of laches to absolve a compacting state of violating an interstate compact. *See* Rep. vol. I at 150.

Traditionally, equitable considerations have played no role in determining violations or liability for past damages in compact enforcement proceedings. *See Texas v. New Mexico*, 462 U.S. 554 (1983); 482 U.S. 124 (1987). This Court recently said in *Nebraska v. Wyoming*, 113 S.Ct. 1689 (1993):

> The two types of proceeding [enforcement action versus modification of a prior equitable apportionment decree] are markedly different. In an enforcement action, the plaintiff need not show injury. When the alleged conduct is admitted, the only question is whether that conduct violates a right established by the decree. To be sure, the right need not be stated explicitly in the

> decree . . . . But the underlying issue primarily remains one of interpretation. In a modification proceeding, by contrast, there is by definition no pre-existing right to interpret or enforce. At least where the case concerns the impact of new development [requiring a new or modified equitable apportionment], the inquiry may well entail the same sort of *balancing of equities* that occurs in an initial proceeding to establish an equitable apportionment. 113 S.Ct. at 1695 (emphasis added) (citations omitted).

Even though the equitable apportionment of the Arkansas River was already achieved in the Compact, Colorado is essentially asking the Court to once again "balance the equities" when it asks that an admitted violation of the Compact be overlooked for equitable reasons outside the Compact. Colorado is asserting that, for the 36-year period 1950-85, equitable considerations should defeat the apportionment of waters adopted by its own General Assembly and by Congress pursuant to Article I, Section 10, Clause 3 of the Constitution. To do so would, in effect, amount to a reapportionment of the waters of the Arkansas River for the period 1950-85. The Court has addressed its ability to alter the terms of an interstate compact:

> Under the Compact Clause, two States may not conclude an agreement such as the Pecos River Compact without the consent of the United States Congress. However, once given, "congressional consent transforms an interstate compact within this Clause into a law of the United States." One consequence of this metamorphosis is that, unless the compact to which Congress has consented is somehow unconstitutional, *no court may order relief inconsistent with its express terms. Texas v. New Mexico*, 462 U.S. 554, 564 (1983), (emphasis added) (citations omitted).

Colorado is asking this Court for nothing less than to order relief inconsistent with the express terms of the Arkansas River Compact. Those express terms, found in Article IV-D, prohibit future beneficial developments of the Arkansas River Basin in Colorado that involve the improved or prolonged functioning[11] of existing works and that materially deplete the waters of the Arkansas River in usable quantity or availability for use to the water users in Kansas and Colorado.

Colorado cites a number of non-compact enforcement cases to support its contention that laches should apply in a compact enforcement case such as the present one. Colo. Brief at 29-30. This approach fails to recognize the considerable difference between entering an injunction based on equitable principles and enforcing a federal statute in the form of an interstate compact.

Colorado cites *Missouri v. Illinois*, 200 U.S. 496, 520 (1906) for the proposition that "[i]t would be contradicting a fundamental principle of human nature to allow no effect to the lapse of time, however long." Colo. Brief at 30. Contrary to the truncation of the quotation by Colorado, the sentence quoted continues, after a citation, as follows: "yet the fixing of a definite time usually belongs to the legislature rather than the courts." 200 U.S. at 520. The sentence appears in the midst of a discussion by Justice Holmes of the difficulties of establishing a system of law applicable to interstate disputes which does not fall within the power of Congress to regulate. The implication that arises by the truncation of the quotation in the Colorado Brief—that this Court will step in at some point and impose a time limit—does not exist in the opinion when read as a whole.[12] The point of the discussion

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[11] For the meaning of "improved or prolonged functioning," *see* note 7, *supra*.

[12] A fuller quotation from the opinion is as follows:

> The Constitution extends the judicial power of the United States to controversies between two or more States and between a State and citizens of another State, and gives this court original jurisdiction in cases in which a State shall be

is that, except in unusual circumstances, the Court will not impose a time limit for the bringing of interstate actions if Congress has not seen fit to impose one.

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a party. Therefore, if one state raises a controversy with another, this court must determine whether there is any principle of law, and, if any, what, on which the plaintiff can recover. But the fact that this court must decide does not mean, of course, that it takes the place of a legislature. Some principles it must have power to declare. For instance, when a dispute arises about boundaries, this court must determine the line and in doing so must be governed by rules explicitly or implicitly recognized. It must follow and apply those rules, even if legislation of one or both of the States seems to stand in the way. But the words of the Constitution would be a narrow ground upon which to construct and apply to the relations between States the same system of municipal law in all its details which would be applied between individuals. If we suppose a case which did not fall within the power of Congress to regulate, the result of a declaration of rights by this court would be the establishment of a rule which would be irrevocable by any power except that of this court to reverse its own decision, an amendment of the Constitution, or possibly an agreement between the States sanctioned by the legislature of the United States.

The difficulties in the way of establishing such a system of law might not be insuperable, but they would be great and new. Take the question of prescription in a case like the present. The reasons on which prescription for a public nuisance is denied or may be granted to an individual as against the sovereign power to which he is subject have no application to an independent state. *It would be contradicting a fundamental principle of human nature to allow no effect to the lapse of time, however long, yet the fixing of a definite time usually belongs to the legislature rather than the courts.* The courts did fix a time in the rule against perpetuities, but the usual course, as in the instances of statutes of limitation, the duration of patents, the age of majority, etc., is to depend upon the lawmaking power. *Missouri v. Illinois*, 200 U.S. at 519-20 (emphasis added) (citations omitted).

Colorado suggests that allowing laches to be asserted against Kansas in this case would ease the Court's burden. Colo. Brief at 31. The result of accepting the Colorado position is actually the opposite, as the Master recognized. He said, "Moreover, equitable defenses should not be applied in ways to encourage or force early litigation between states, particularly when a state is implementing efforts to address the problem." Rep. vol. I at 170. If Colorado's position is accepted, early litigation will be encouraged between states; no efforts to resolve disputes prior to litigation will be undertaken because informal complaints short of bringing suit are insufficient according to the cases cited by Colorado. *See, e.g., A.C. Aukerman Co. v. R.L. Chaides Constr. Co.*, 960 F.2d 1020 (CA Fed 1992); *Potash Co. of America v. International Minerals & Chem. Corp.*, 213 F.2d 153 (CA10, 1954); *Jensen v. Western Irrigation & Mfg.*, 650 F.2d 165 (CA9, 1980). Thus, application of the doctrine of laches will only increase litigation because any action short of filing suit may become a bar to later recovery.

Colorado contends that laches should be applied because Colorado "had no reason to believe it would be sued." Colo. Brief at 31 n.27. By this assertion, Colorado seeks to distinguish its position from New Mexico's position in *Texas v. New Mexico*, 482 U.S. at 129, that it should have been absolved of its compact violations because it believed in good faith that it was complying with the Pecos River Compact. The Court answered New Mexico's argument as follows:

> But good-faith differences about the scope of contractual undertakings do not relieve either party from performance. A court should provide a remedy if the parties intended to make a contract and the contract's terms provide a sufficiently certain basis for determining both that a breach has in fact occurred and the nature of the remedy called for. There is often a retroactive impact when courts resolve contract disputes about the scope of a promisor's undertaking; parties

> must perform today or pay damages for what a court decides they promised to do yesterday and did not. In our view, New Mexico cannot escape liability for what has been adjudicated to be past failures to perform its duties under the Compact. *Id.* (citations omitted).

Colorado's contention that it differs from New Mexico because it had no reason to believe that it would be sued is unpersuasive. In the dispute over the Pecos River, New Mexico asserted various reasons why it should not be sued or be required to pay damages in water or money for violations of the Pecos River Compact—a position consistently rejected by this Court. *See Texas v. New Mexico*, 462 U.S. 554 (1983), 482 U.S. 124 (1987). Likewise, Colorado's similar position should be rejected.

B. Kansas Was Not Guilty of Laches in Making Its Well Claim.

Notwithstanding this Court's statements that laches generally does not apply in interstate controversies, and the fact that laches has never been applied in any compact enforcement case, Colorado devotes much of its argument to asserting facts that it believes would support the defense of laches. Colo. Brief at 32-64 and *passim*. Contrary to Colorado's argument, those facts would not support the defense of laches even if it were applicable. Laches requires an inexcusable delay. Here, there was no delay at all. Kansas brought the well-pumping issue to the Compact Administration without delay after it received a report from its consultants, Simons, Li & Associates, indicating a Compact violation. Rep. vol. I at 153. This was done in compliance with Article VIII-H of the Compact, Rep. App., Ex. 1 at App. 15. Even then Colorado opposed such an investigation on the ground that it was not justified. Jt. Ex. 32 at 22-23 (R. vol. 14 at 12, 22, 26), Pl. Reply App., Item 7. Kansas had no knowledge nor reason to know that Colorado pumping was violating the Compact before being informed by its consultants in 1984. That report was initiated,

after the Trinidad dispute arose, in order to determine whether Trinidad operations or any other activity in Colorado constituted a violation of the Compact. Jt. Ex. 88 at 1.1, Pl. Reply App., Item 8.

Colorado consistently intermingles references to alleged knowledge on the part of Kansas concerning the effect of postcompact well pumping and knowledge merely of the extent of postcompact well pumping. Colo. Brief at 32 & n.28.[13] Knowledge of the existence of wells and extent of pumping in Colorado is insufficient to support a claim of laches. Colorado has not shown that Kansas knew or should have known of the *effects* of pumping on usable stateline flows.

1. Kansas Did Not Know Nor Should It Have Known of the Facts Giving Rise To Its Claim by 1956.

Colorado makes the extreme claim that "Kansas knew or should have known of the facts giving rise to its claim by 1956." Colo. Brief at 36. This extreme position is based on a 1956 USGS Report which discusses the recent increase in irrigation wells in Colorado. *See* Colo. Brief at 37. Colorado has failed to distinguish between knowledge of the existence of wells and knowledge of the effects of their pumping on usable flows at the stateline—the critical factor for determining compliance with the Compact. This failure on Colorado's part infects its whole discussion of this critical factual issue. *See* Colo. Brief at 36-48.

Colorado claims that Kansas has relinquished its right to relief because of certain deposition testimony of Howard Corrigan, a former water commissioner in the Garden City field office of the Kansas Division of Water Resources. Colo. Brief at 39-41. Mr. Corrigan was never a member of the Kansas delegation to

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[13] Colorado suggests that "the Master apparently found that Kansas knew or should have known about the extent of post-compact well pumping in Colorado in 1968 . . . . " Colo. Brief at 32 n.28. There is no finding to this effect in the Master's Report.

the Arkansas River Compact Administration. *See* Colo. Brief at 39 n.33. Yet Colorado asserts that his state of knowledge, coupled with lack of complaint by the Kansas delegation, whose state of knowledge is unknown, should result in the loss of Kansas' compact rights. Not only is the knowledge of a water commissioner of the Garden City field office of the Kansas Division of Water Resources insufficient to cause a loss of Kansas' Compact rights, but also the extent of the local official's knowledge was itself insufficient to cause such a loss of rights. The deposition testimony established at most that the local water official was aware of well development in Colorado in the 1950s and that at some *unspecified* point in time he became aware that wells indirectly took water out of the river increasing transit loss.[14] However, this knowledge still falls well short of the knowledge of effects of pumping on usable flows at the state line needed to assess whether Colorado was violating Article IV-D of the Compact because of the numerous factors involved. This critical shortcoming was recognized by the Master.[15] It has also been recognized by the Colorado Supreme Court. *See Kuiper v. Atchison, Topeka & Santa Fe Ry.*, 581 P.2d 293 (Colo. 1978) (discussed *infra* at 22-23).

Nevertheless, Colorado claims that "[t]he Master misconceives the issue." Colo. Brief at 42. Colorado asserts that the issue is "whether Kansas knew or, in the exercise of reasonable diligence, should have known of facts giving rise to its claim before 1968." *Id.* This question is answered by the fact that Colorado itself did not know of a Compact violation prior to 1985 and did not believe any investigation of the possibility of a violation was

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[14] The deposition took place Feb. 9, 1990, some six years after the Simons, Li Report was completed.

[15] "[T]he evidence is sketchy and does not demonstrate that these officials were aware of the number of wells, the extent of Colorado's pumping, or the impact or even potential impact of pumping on usable Stateline flows. Colorado frequently refers to 'well development,' but that alone does not violate the compact." Rep. vol. I at 164.

warranted. In 1975, for example, the Colorado State Engineer's office issued a report entitled "Stream Depletion By Wells in the Arkansas River Basin." In that report the Colorado State Engineer (the chief water official of Colorado) concluded that the "increasing use of ground water for irrigation in the Arkansas River basin since 1950 has affected stream flows in such a way as to deprive senior water users of a portion of their lawful water supply." Jt. Ex. 94 at 53 (R. vol. 16 at 25, 34). Pl. Reply App., Item 9. The study area for the report stretched from Canon City, above Pueblo, to the Colorado-Kansas state line. *Id.* Counsel for Colorado asked the State Engineer of Colorado in testimony in this case whether the effects on stream flows in the report "translate into a reduction in state line flows in your opinion." The State Engineer answered: "No, not in the evaluation that we did in this report." R. vol. 78 at 85, Pl. Reply App., Item 15. *See* Rep. vol. I at 161. Thus, it was not clear to the Colorado State Engineer that depletions of streamflows upstream in Colorado would result in reductions in flows at the state line, much less material depletions of usable stateline flows in violation of Article IV-D.

When the litigation in which the State Engineer submitted the 1975 Report reached the Colorado Supreme Court in 1978, that court assessed Colorado's knowledge as follows:

> When water in the aquifer is brought to the surface by a well and there is a consumptive use of that water by evaporation and evapotranspiration of phreatophytes, generally the surface supply is depleted by the amount of such consumptive use. The evidence and findings in this case demonstrate, however, that the restriction of wells does not necessarily result in a comparable increase in the supply of surface water. There are countereffects which offset or modify the depletive use of well water. Some of these are: variations in the amount of river flow; winter irrigation; reduction in evaporation and phreatophyte losses as a result of lowering of water tables; changes in ground water storage;

> extent of alluvium recharge occurring during wet cycles or as a result of widespread winter irrigation practices; and increased irrigation efficiencies. Other factors which may also be involved are increased ground water storage, stock ponds, municipal sewage lagoons, potholes, changes in side channel inflows, and cyclical fluctuations through wet and dry periods. *Kuiper v. Atchison, Topeka & Santa Fe Ry.*, 581 P.2d at 295-96 (Colo. 1978).

The Colorado Supreme Court's reasoning amply demonstrates why knowledge of increased pumping is not tantamount to knowledge of depletions at the state line. In addition to the considerations noted by the Colorado Supreme Court, there are additional considerations involved in determining whether Compact violations are likely to occur. The existence, amount and timing of transmountain imports from the Colorado River Basin and the return flows from such waters must be determined.[16] Whether flows being depleted are usable or not must be determined, which, in turn, requires that a definition of usability be determined, something that is still pending in the present litigation. Thus, many considerations come into play, and the rudimentary information that was elicited by Colorado regarding the knowledge of a local water official in Kansas falls far short of the information needed to establish knowledge of a material depletion of usable stateline flows.

Colorado strenuously maintains that it is not just what Kansas knew, but what it should have known, that is determinative for purposes of laches. Colo. Brief at 42. Colorado asserts in effect that Kansas should have made an investigation of the effects of

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[16] Article III-B limits the waters apportioned by the Compact to "waters originating in the natural drainage basin of the Arkansas River, including its tributaries, upstream from the state line, and excluding water brought into the Arkansas River Basin from other river basins." Rep. App., Ex. 1 at App. 2-3.

well pumping on usable flows at the state line in 1956. However at the October 4, 1985 meeting of the Compact Administration, Colorado's delegation rejected the demand of the Kansas delegation for an investigation of the effects of well pumping on usable stateline flows. Mr. J. William McDonald, Director of the Colorado Water Conservation Board and chief of the Colorado delegation to the Compact Administration submitted a memorandum on the subject which concluded as follows:

> [A]t this time, I cannot agree to undertake an investigation into well development in Colorado when the single and double-mass diagrams do not suggest that well development in Colorado has had an impact on usable stateline flows. Jt. Ex. 32 at 23 (R. vol. 14 at 12, 22, 26), Pl. Reply App., Item 7.

In addition, Mr. McDonald refused to accept the previous investigations of well pumping in Colorado. *Id.* at 15. Colorado obviously believed strongly that there was no reason to suspect that well pumping in Colorado could be causing violations of the Compact. It is therefore unreasonable to conclude that Kansas, the downstream state, should nevertheless have initiated its own investigation to determine those effects and should have done so many years before.

Colorado has the burden of proof on all elements of the defense of laches. *See, e.g., Costello v. United States*, 365 U.S. 265, 282 (1961); *White v. Daniel*, 909 F.2d 99, 102 (CA Fed 1990), *cert. denied*, 501 U.S. 1260 (1991); *A.C. Aukerman Co. v. R.L. Chaides Constr. Co.*, 960 F.2d 1020, 1032 (CA Fed. 1992). Colorado has failed in the most essential part of this burden—namely, to show that there was a delay before the filing of this action during which Kansas knew or should have known that it had a claim against Colorado under the Compact based on increased postcompact well pumping in Colorado. In fact, Kansas has affirmatively shown that when Kansas ultimately became aware of the probable existence of a Compact violation through

the Simons, Li Report, Jt. Ex. 88 at iv-v (R. vol. 13 at 117, 121, 127), Pl. Reply App., Item 8, in 1984, it made the conclusions available to Colorado without delay and requested a Compact investigation. Rep. vol. I at 153. That Compact investigation was declined by Colorado on the basis of assurances by Colorado that an investigation was not called for.[17] Jt. Ex. 32 at 22-23 (R. vol. 14 at 12, 22, 26), Pl. Reply App., Item 7.

2. Kansas Did Not Delay in Filing This Suit.

Colorado claims that "Kansas has no valid excuse for its lengthy delay." Colo. Brief at 48. The problem with Colorado's position is that there was no "lengthy delay" by Kansas. In fact, there was no delay at all. The period of delay for purposes of laches begins when the plaintiff knew or should have known of his claim against the defendant. *Studiengesellschaft Kohle v. Eastman Kodak Co.*, 616 F.2d 1315, 1326 (CA5 1980), *cert. denied*, 449 U.S. 1014 (1980); *Jensen v. Western Irrigation & Mfg.*, 650 F.2d 165, 168 (CA9 1980). Yet we have seen that in late 1985, only weeks before the filing of this action, Colorado itself was not aware of impacts on stateline flows that could be violations of the Arkansas River Compact, nor even the need to investigate such impacts. Therefore, there was no delay on Kansas' part and no reason to look for excuses for any delay.

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[17] In the early 1980s, the Colorado State Engineer went to the Colorado Supreme Court seeking reversal of a finding by the Water Court that postcompact wells in the Arkansas Valley in Colorado were depleting usable flows. *See People ex rel. Danielson v. Amity Mut. Irrigation Co.*, 668 P.2d 1368, 1370 & n.3 (Colo. 1983). This is a further indication that the Colorado State Engineer believed there were no compact violations in the early 1980s.

3. Colorado Was Not Prejudiced by Kansas' Alleged Delay.

Assuming, *arguendo*, that laches is a defense available to Colorado in this litigation and that there was an unexcused delay by Kansas in bringing this litigation, laches would nevertheless be inapplicable because there was no prejudice to Colorado as a matter of fact, as shown below.

a. There Was No Evidentiary Prejudice to Colorado.

Colorado complains that evidence on electric power records, on nonelectric power sources, from Kansas witnesses and on the Garden City streamflow gage, is missing, but could have been obtained if Kansas had complained earlier about the postcompact well pumping. Colo. Brief at 55-61.

The implication of the Colorado argument is that Colorado is bearing the risk of the lack of data with respect to a postcompact development initiated without obtaining sufficient information beforehand. This is as it should be. Colorado allowed the installation of many hundreds of wells without requiring those wells to have flow meters installed and without gaining the kind of pre-approval exemplified by the Trinidad Reservoir Operating Principles. Under these circumstances, it is Colorado that should bear the risk that later analysis will show that insufficient information was collected before going ahead. The risk should not be on the downstream state, which only suffered from this development and received no benefits and which did not have the access necessary to collect the data or the jurisdiction to require the collection of data. *Cf.* Kansas Brief in Support of Exceptions at 28-32.

Kansas has nevertheless suffered from the lack of data kept by Colorado. For instance, the Master has rejected the Kansas quantification of precompact pumping entitlement at 11,000 acre-feet per year in favor of the 15,000 acre-feet per year figure developed by the USGS. This increases the precompact pumping

entitlement by 144,000 acre-feet above the Kansas estimate for the 36-year study period (4,000 acre-feet per year × 36 years = 144,000 acre-feet). Colorado's failure to collect data has allowed Colorado to claim as much as 36,000 acre-feet per year of pre-compact pumping. Rep. vol. I at 62. If this extreme figure were accepted, Colorado's precompact pumping entitlement would be 756,000 acre-feet above the Master's recommended level (21,000 acre-feet per year × 36 years = 756,000 acre-feet).

The Master rejected Colorado's assertion that Kansas' alleged failure to complain in a timely fashion had made it difficult for Colorado to defend itself and determine key factual issues because of a lack of data:

> However, I doubt that complaints from Kansas realistically would have made any difference in Colorado's data collection system. I note that the 1968 W. W. Wheeler Report which was authorized by the Colorado legislature recommended that 'Accurate and continuous discharge records be obtained of major tributary inflow,' and that 'Recorders be installed on all wells.' Jt. Exh. 92 at vii. Yet nothing substantial was done. Indeed, these recommendations still have not been implemented. Rep. vol. I at 148.

Colorado continued to do nothing substantial to collect additional data after the complaint was made by Kansas or even after this litigation was initiated by Kansas. Even after Colorado became aware as a result of its own calculations which are in evidence that its postcompact wells were violating the Compact, Colorado took no substantial steps to curtail the pumping. Colorado claims that it did respond to the W. W. Wheeler Report and that the Master's statement quoted above is "inaccurate and unfair." Colo. Brief at 59. Colorado supports this statement by citing to streamflow gages. *Id.* at 60. No mention is made of the failure to meter wells, nor of the fact that the operation of the Big Sandy gage

(on the biggest tributary below John Martin Reservoir) was terminated in 1982. *See* Colo. Brief at 60.

Colorado also purports to have been prejudiced by the lack of witnesses who could have established the knowledge that Colorado needed to establish its laches defense. Colo. Brief at 60-61. Aside from the circularity of reasoning involved in this position, Colorado has not established that the persons it claims had knowledge of Compact violations were persons whose knowledge would have the legal effect of precluding a claim of the State of Kansas under the Compact.

b. There Was No Economic Prejudice to Colorado.

In *Costello v. United States*, 365 U.S. 265 (1961) the Court noted that one element of laches is proof of prejudice to the party asserting the defense. *Id.* at 282. As in that case, the passage of time since Colorado began violating the Compact seems "plainly to have worked to [Colorado's] benefit, not to [its] detriment." *Id.* The Court pointed out that Congress had not seen fit to enact a time bar applicable to that proceeding and determined that depriving the petitioner of his citizenship after 27 years was not unreasonable because he had never been entitled to that citizenship. *Id.* at 283-84. Likewise, as the Master pointed out, Rep. vol. I at 156-59, Colorado farmers obtained economic value from their wells over a period that began some 45 years ago in 1949. The passage of time has "permitted the benefits of those wells to be increasingly enjoyed and such investments amortized." *Id.* at 157. Moreover, the Colorado testimony is that not much was invested in the wells and that they were not maintained at high levels of efficiency. *See* R. vol. 63 at 188-90, Pl. Reply App., Item 12; vol. 65 at 69-70, Pl. Reply App., Item 13.

Colorado states, "Economic prejudice may arise where the defendant will suffer the loss of monetary investments or incur damages which likely would have been prevented by earlier suit." Colo. Brief at 54. This could be the case where an equivalent

alternative water supply had been rejected in favor of the wells that have now been found to be illegal by the Master. However, there was no cheaper alternative. The fact that the farmers found it preferable to throw the switch on their wells rather than procure additional water supplies from another source is evidence that it was the cheapest alternative available. Indeed, the farmers in Colorado turned on their wells rather than buy water from the Fryingpan-Arkansas Project.[18] As stated by Colorado, the expectation had been that transmountain imports from the Colorado Basin would average 196,000 acre-feet per year. Colo. Brief at 7. However, the expected demand for transmountain water did not materialize as expected from the farmers who now had the opportunity to obtain water by well pumping.[19] Thus, Colorado did not give up an equal opportunity to obtain water from another source in favor of wells, but rather has enjoyed the cheaper source of water in increasing amounts.

The Colorado contention is essentially that it would have been cheaper to have had no postcompact wells at all than to have pumped them as they did. Nothing in the record supports such an implausible contention. In response to the Master's conclusion that the passage of time permitted the benefits of wells to be increasingly enjoyed and such investments amortized, Colorado says, "This analysis confuses benefits of wells to well owners with prejudice to Colorado." Colo. Brief at 62. The confusion, however, rests not with the Master but with Colorado. Article VII-A of the Arkansas River Compact provides as follows:

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[18] The Fryingpan-Arkansas Project is a project of the U.S. Bureau of Reclamation. The Project was authorized by Congress in 1962. Act of Aug. 16, 1962, P.L. 87-590, 76 Stat. 389. One purpose of the Project was to import water from the Colorado River Basin for use in the Arkansas River Basin. *See id.*

[19] On average, transmountain imports have amounted to only 120,000 acre-feet annually since 1972. Rep. vol. II at 49; Colo. Brief at 8 n.8.

> A. Each State shall be subject to the terms of this Compact. Where the name of the State or the term "State" is used in this Compact these shall be construed to include any person or entity of any nature whatsoever using, claiming or in any manner asserting any right to the use of the waters of the Arkansas River under the authority of that State. Rep. App. Ex. 1 at App. 10-11.

This provision of the Compact removes any doubt that the benefits of individual well owners in Colorado are imputed to Colorado under the Compact. It is therefore nonsensical to try to draw a distinction between benefits to Colorado water users and benefits to the State of Colorado.

4. Laches Should Not Bar a Claim for Damages Before 1985.

Colorado would essentially bar all retrospective remedies that Kansas has under the Compact and the decisions of this Court. This suggestion by New Mexico in the Pecos River litigation was rejected by the Court, as discussed *supra* at 12.

II. Article IV-D Limits Well Pumping in Colorado to 15,000 Acre-Feet Per Year.

A. Precompact Wells Should At Least Be Limited to Pumping the Highest Amount Pumped in the Years During Which the Compact Was Negotiated.

Colorado begins its discussion of the Colorado position that it is entitled to pump 50,000 acre-feet per year based on precompact pumping, by criticizing the Master for relying on "what he believed the Compact negotiators had intended." Colo. Brief at 66. Colorado's contention is that the Master erred in ignoring

the subsequent practice of the parties to the Compact.[20] In essence, Colorado would like the Court to change the Compact based on Colorado's view of the actions of the parties since the adoption of the Compact. The Court, however, has made abundantly clear in the past that this cannot be done. *See, e.g., Texas v. New Mexico*, 462 U.S. 554, 564 (1983)("[U]nless the compact to which Congress has consented is somehow unconstitutional, no court may order relief inconsistent with its express terms."). Much of the Colorado argument is based on Colorado's allegation that Kansas made no objection to well development in Colorado nor prevented such development in Kansas. This argument assumes that Kansas knew or should have known of the effects of pumping on Colorado's Compact obligations to Kansas. As has been shown, this position by Colorado is untenable as a matter of fact. *See supra* at 19-24. Also, what Kansas was doing with regard to the administration of wells in Kansas is an issue that might be of relevance in an equitable apportionment proceeding, but not in a compact enforcement proceeding such as the present one.

Colorado contends that its wells should be allowed to pump to the full extent of their rights as recognized by Colorado state law. As part of this argument, Article VI-A(2) of the Compact is put forward by Colorado as a protection against the Master's interpretation of the Compact. Colo. Brief at 68-69. Article VI-A(2) provides as follows:

> *Except as otherwise provided*, nothing in this Compact shall be construed as supplanting the administration by Colorado of the rights of appropriators of waters of the Arkansas River in said State as decreed to said appropriators by the courts of Colorado, nor as interfering with the distribution among said appropriators by Colorado, nor as curtailing the diversion and

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[20] Colorado's reference to "subsequent practice" is essentially a reassertion of its laches argument that Kansas delayed too long in filing the litigation. Colo. Brief at 66-67.

> use for irrigation and other beneficial purposes in Colorado of the waters of the Arkansas River. Rep. App., Ex. 1 at App. 10 (emphasis added).

Colorado tends to overlook the introductory emphasized phrase of Article VI-A(2). "Except as otherwise provided" refers at least to Article IV-D of the Compact and its proviso that the waters of the Arkansas River must not be materially depleted in usable quantity or availability. In other words, Article IV-D cannot be circumvented by reliance on Article VI-A(2). The supremacy of Article IV-D is assured by the concessive introductory phrase of Article VI-A(2).

Colorado claims that "nothing in Article IV-D states that pre-compact wells in Colorado are limited to pumping the amounts that were pumped during the pre-compact period." Colo. Brief at 69. Colorado claims that the Master "has read into Article IV-D" this limitation. *Id.* This argument, however, fails to take account of the plain meaning of the language that is included in Article IV-D. That Article prohibits "future beneficial development . . . which may involve construction of dams, reservoir, and other works for the purposes of water utilization and control, as well as the *improved or prolonged functioning of existing works*" if such development materially depletes the waters of the Arkansas River in usable quantity or availability. Rep. App., Ex. 1 at App. 5. The increases in pumping were certainly "future" at the time of the Compact. The increase in pumping of precompact wells could only be achieved through prolonging the functioning of those wells or improving the functioning of those wells. Colorado is asking this Court to accord Colorado the right to continue to enjoy the improved and prolonged functioning of its precompact wells. To do so would be to order relief inconsistent with the terms of the Compact, which this Court has refused to do. *Texas v. New Mexico*, 462 U.S. 554, 564.

Colorado bases its argument on precompact entitlement in part on the fact that the provisions of Article V-H refer to the transfer of "ditch diversion *rights*." Colo. Brief at 69 (emphasis

in Colo. Brief). This Article places special requirements on transfers of surface water rights from below John Martin Reservoir to above the reservoir. *See* Rep. App., Ex. 1 at App. 9. Colorado argues that the reference to "rights" in Article V-H means that Article IV-D must also be similarly interpreted. This argument does not make sense, however, because the subject matter of the two articles is different. Article IV-D is directed at future developments, while Article V-H is directed at the transfer or increase of existing surface water rights.

Colorado seems to believe that the use of the word "rights" is significant. The use of the word "rights" in Article V-H *is* significant, but not for the reason that Colorado asserts. Its use in Article V-H shows that the negotiators intentionally refrained from using "rights" in Article IV-D. Its obvious absence from Article IV-D shows that their purpose was to prevent further depletions of usable flow regardless of whether someone then or later could make a claim of "right" under Colorado law. The same word was not used in Article IV-D because the purpose of IV-D was different, namely, to allow future development, including the improved or prolonged functioning of existing works, provided that such development did not materially deplete the waters of the Arkansas River in usable quantity or availability for use. *See* Rep. vol. II at 190-95. The Master makes the fundamental point that to accept the Colorado position is to reallocate the waters of the Arkansas River in a massive amount, contrary to the intentions of the negotiators of the Compact. *Id.*

Colorado continues to argue that its "pre-compact wells should be permitted to pump in accordance with Colorado law." Colo. Brief at 72. This is a restatement of the Colorado position that "the rights of the precompact well appropriators, as decreed by the Colorado courts, are 'binding on Kansas'." Rep. vol. II at 193.

In *Hinderlider v. La Plata River & Cherry Creek Ditch Co.*, 304 U.S. 92 (1938), another case in which Colorado appropriators claimed that their decreed Colorado water rights superseded an interstate compact (the La Plata River Compact between Colo-

rado and New Mexico), the Court, after first assuming that the decreed water right involved was a property right indefeasible so far as Colorado was concerned, stated:

> But *the Colorado decree could not confer upon the Ditch Company rights in excess of Colorado's share of the water of the stream*; and its share was only an equitable portion thereof.
>
> The claim that on interstate streams the upper State has such ownership or control of the whole stream as entitles it to divert all the water, regardless of any injury or prejudice to the lower State, has been made by Colorado in litigation concerning other interstate streams, but has been consistently denied by this Court. The rule of equitable apportionment was settled by *State of Kansas v. Colorado*. It was discussed again in *Wyoming v. Colorado*, where the Court said: "The contention of Colorado that she as a state rightfully may divert and use, as she may choose, the waters flowing within her boundaries in this interstate stream, regardless of any prejudice that this may work to others having rights in the stream below her boundary, cannot be maintained. The river throughout its course in both states is but a single stream, wherein each state has an interest which should be respected by the other. A like contention was set up by Colorado in her answer in *Kansas v. Colorado* and was adjudged untenable. Further consideration satisfies us that the ruling was right." 304 U.S. at 102-03 (citations omitted).

Later in the same opinion the Court stated that an apportionment of an interstate stream by compact or decree of the Court "is binding upon the citizens of each State and all water claimants, even where the State had granted the water rights before it entered into the compact." *Id.* at 106. Thus, the fact that certain water rights might be sanctioned by Colorado decrees (most of

which were issued in unopposed proceedings long after the claimed initiation of use, Rep. vol. II at 191), is of no consequence to the Compact allocation between Colorado and Kansas of the waters of the Arkansas River. The Colorado argument, based on the discredited notion that Kansas is bound by the Colorado water court decrees, should be rejected by the Court as it was by the Master.

B. The USGS Estimates for the 1940s Are Reasonable.

1. Both Colorado and Kansas Experts Relied on the 1970 USGS Report.[21]

As Colorado recognizes, both states relied on the United States Geological Survey 1970 Report for power coefficients to estimate use during the 1964-68 period. Colo. Brief at 75. The use of power coefficients was made necessary because Colorado has not required the use of flow meters to measure the amounts of water pumped by wells. However, Colorado claims that "experts for neither state relied on the USGS pumping estimates for the period 1940-63 in the report." Colo. Brief at 75. This is not true. Mr. Book testified that he relied on the figures determined by the USGS for the earlier years as a check against the work that he did based directly on power records. This comparison confirmed for him that the study area for the USGS figures was somewhat larger than the study area for this case and confirmed the validity of the 11,000 acre-foot figure that he had determined. Tr. vol. 125 at 59-61, Pl. Reply App. Item 17. Just as importantly, Kansas relied on the USGS figures to conclude that the pumping

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[21] T.J. Major, R.T. Hurr, and John E. Moore, 1970, "Hydrogeologic Data for the Lower Arkansas River Valley, Colorado," Colorado Water Conservation Board, Ground Water Basic Data Release No. 21, Jt. Ex. 66 (R. vol. 15 at 21, 25, 30). For a description of this report, see Rep. vol. I at 158. As the title of the report reveals, the report was done by the USGS in cooperation with Colorado.

in 1948 was equal to or greater than all previous years back through 1940. *Id.*

2. Colorado's Witness Defended the USGS Pumping Estimates Before the Special Master.

Colorado called as its witness the lead author of the 1970 USGS Report, BDR-21, Thomas J. Major, for purposes of testifying on that report. As the Master points out, Mr. Major, a 26-year USGS employee, "staunchly defended the accuracy of the USGS's pumping estimates." Rep. vol. II at 187. Mr. Major was surprised to learn during his testimony that, although Colorado accepted some of the results of the report, Colorado was claiming nevertheless that the precompact pumping figures in the report were unreliable. In particular, he was not aware that Colorado was claiming that the highest pumping during the 1940s was 15 times greater than the USGS figure for the same year. R. vol 129 at 34, 61-62, Pl. Reply App., Item 18. Nevertheless, he defended the accuracy of the report's figures. *Id.* Thus, Colorado's position amounts to a refusal to accept verification by its own witness and lead author of the USGS Report of the USGS precompact pumping figures. Moreover, Colorado claims that Mr. Major was not qualified as an expert in making pumping estimates. It is technically true that Colorado did not present Mr. Major as an expert in making pumping estimates. However, he was called by Colorado to testify on the report and he was sufficiently expert to be appointed lead author of the study by the U.S. Geological Survey. Colorado asserts that the "basis, and the only basis, for Mr. Major's defense of the accuracy of the USGS pumping estimates was that those figures were subject to the normal USGS peer review and checking and he had no reason to doubt Mr. Hurr's work." Colo. Brief at 76-77. It would seem that there is hardly a higher recommendation for the accuracy of figures than that contained in the Colorado statement. It was subject to "normal USGS peer review and checking" and it was done by an independent federal agency without the pressure of litigation. It

is hard to see how such information could come more highly recommended.

3. The Supreme Court of Colorado Adopted Estimates Equivalent to the USGS Estimates.

Colorado not only criticizes the USGS, but its own Supreme Court for concurring with the USGS figures for precompact pumping. Colo. Brief at 77. Colorado claims that the Colorado Supreme Court's use of the precompact figures was an uncritical use and does not establish that they were reasonable. Colo. Brief at 77. On the contrary, it is best to rely on figures accepted by Colorado when there was no pressure of trial advocacy as there is in this case.

In *Fellhauer v. People*, 447 P.2d 986 (Colo. 1968), the Colorado Supreme Court said, "In 1940 only 2,000 acre feet were being pumped from wells in the Arkansas Valley." *Id.* at 991. In the present case, Colorado claims the pumping in 1940 was 36,837 acre-feet. Rep. vol. II at 187. The USGS figure was 2,000 acre-feet for 1940. *Id.* at 185.

4. The Colorado State Engineer Relied on the USGS Estimates in His 1975 Report.

Colorado admits that the Colorado State Engineer, in a report prepared in 1975 for purposes of presentation to the Colorado Water Court in support of regulations, relied on the USGS pumping figures. Colo. Brief at 78. The former State Engineer testified in support of his report under oath in the 1975 proceeding in Colorado water court. Pl. Ex. 514, vol. I at 213-14 (R. vol. 17 at 5, 7), Pl. Reply App., Item 2. Even in the present proceeding he testified that the estimates were the best his staff could achieve at the time of the report. R. vol. 77 at 30-31, Pl. Reply App., Item 14. The USGS pumping figures relied upon by the Colorado State Engineer himself and other state and federal agencies for years, have become inconvenient under the present

circumstances and Colorado is marshalling all of its powers to repudiate these figures, which up to now it has always considered acceptable.

5. Mr. Book Relied in Part on the USGS Estimates.

Colorado states that Dale Book, one of Kansas' expert witnesses, "did not rely on the USGS estimates in making the Kansas estimates" for 1948. Colo. Brief at 79-80. While it is true that Mr. Book developed estimates for 1948 independently based on power records and pumping coefficients, since no water meters were required by Colorado, Mr. Book relied on the USGS figures for the conclusion he drew that 1948 pumping was equal to or greater than previous pumping back through 1940. R. vol. 125 at 59-61, Pl. Reply App. Item 17.

6. The Colorado Precompact Pumping Estimates Are Not Reasonable.

Colorado's highest actual precompact pumping amount is fifteen times larger than the USGS figure for the same year (1940). *See* Rep. vol. II at 182, 185. If the USGS figures for precompact pumping are reasonable, the Colorado figures are not.

Colorado insists that there is a problem with the USGS pumping estimates because they are inconsistent with power records from the same period. Colo. Brief at 80-81. What Colorado fails to point out is that in the 1975 Colorado State Engineer report, the Colorado State Engineer published his own precompact pumping figures, which agreed in most respects with the USGS precompact pumping figures, and side-by-side published the power use data to which Colorado now refers as the basis for challenging the pumping figures of the Colorado State Engineer and the USGS. *See* Jt. Ex. 94, Table 7 at 22 (R. vol. 16 at 25, 34), Pl. Reply App., Item 9. This shows that the Colorado State Engineer was fully aware of the alleged discrepancies between

the power records and the USGS pumping figures. Nevertheless, he published the pumping figures without qualification. The power figures that Colorado claims are inconsistent are thus not an item of newly discovered evidence, but have been available throughout the several decades over which the USGS figures have been accepted. There is no reason to begin to doubt those figures in this proceeding.

7. Virtually Nothing Is Known About the Power Figures, but the Pumpage Estimates Have Been Accepted by Colorado and the U.S. Government for Many Years.

Colorado has been unable to explain the errors claimed to exist in the USGS estimates. Colorado has accepted the alleged discrepancies between the power figures and the pumping figures until now. In 1975, the former Colorado State Engineer, in his sworn testimony, explicitly discussed both the power figures and the pumping figures without suggesting that there was any reason to doubt the pumping figures. *See* Pl. Ex. 514, vol. I at 213-14, (R. vol. 17 at 5, 7), Pl. Reply App., Item 2.

8. Lack of Discussion of Pumping During the Compact Negotiations Suggests That Pumping Could Not Have Been Large.

Colorado contests the following statement by the Master:

> Current well pumping in Colorado appears simply not to have been a matter of concern to the compact commissioners. Had pumping been of any appreciable magnitude, I cannot believe that such use of water would not have surfaced in the engineering committee report and the compact negotiations. Absence of such discussion leads to the conclusion that pumping at that time was not large, a conclusion which is supported by

> other evidence in the case. Certainly, the compact commissioners did not foresee the technological breakthrough of the turbine pump and other conditions that led to the great increase in pumping which began in the 1950s. That is not to say that the compact language is not broad enough to cover depletions caused by pumping. I believe that it is, and the intent of the commissioners was to protect against material depletions from any cause. However, during the compact negotiations the specific threat appeared to be from future construction of dams and reservoirs, not from pumping. Rep. vol. I at 101-02.

Colorado begins its attempt at refutation by stating that "the Compact Commissioners clearly knew that there was well pumping in both states." Colo. Brief at 83. First, it is pumping in Colorado that is important for this case, not pumping in Kansas. Yet almost all the citations given by Colorado refer to pumping in Kansas. Second, the statements regarding well development in Colorado are scanty and completely unquantified. *See* Def. Ex. 623 at 29-30 (R. vol. 10 at 42, 48), Pl. Reply App., Item 4. Nor is significant pumping generally indicated. *See, e.g.*, Pl. Ex. 205A (R. vol. 4 at 30), Pl. Reply App., Item 1, and other sources cited by Colorado. Colo. Brief at 83. Further, as to individual statements cited, there is no evidence that they were disseminated. *See* R. vol. 10 at 42-43, Pl. Reply App., Item 11.

Colorado then argues that the Engineering Committee Report from the Compact negotiations does not show, by its exclusion of pumping, that the Colorado estimates of pumping for that time are unreasonable. Colo. Brief at 83. In the paragraph in the "Interim Report of Committee on Engineering Data and Studies to Colorado-Kansas Arkansas River Compact Commission," to which Colorado refers (*id.*), which is a paragraph that separates "necessary data" that would be tabulated from "unnecessary data" that would not be tabulated, it is stated, "Irrigation supplies derived from pumps in both states are not included in the tabulated

diversions." Jt. Ex. 5 at 3, (R. vol. 15 at 12), Pl. Reply App., Item 5. The Engineering Committee was thus aware that pumping was occurring in Colorado at that time, but considered it so insignificant as to be unnecessary to include in its work. The Master's conclusion that pumping was small enough in amount to disregard during the time of the Compact negotiations seems to be convincingly borne out by the report of the Engineering Committee.

Colorado also argues that "the absence of discussion of pumping indicates that the Compact Commissioners assumed that rights of pre-compact well owners would be administered in accordance with state law." Colo. Brief at 83-84. On the contrary, there was great uncertainty as to what the Colorado groundwater law was at that time and as to how Colorado would administer its wells. Colorado elicited this conclusion from Dr. Littlefield during cross-examination. R. vol. 10 at 46-47, Pl. Reply App., Item 11. In short, there seems to be no basis at all for Colorado's suggestion that silence on pumping indicated that the Compact Commissioners assumed that rights of precompact well owners would be administered in accordance with state law. Moreover, that conclusion has little to do with the Master's point, which is that the lack of discussion indicates an understanding on the part of the Commissioners that pumping was small enough that it could be ignored.

9. Colorado's Estimates Are Inconsistent With All Prior Determinations of Pumping for the 1940s.

Colorado's estimates of pumping in the 1940s in the Arkansas Valley in Colorado in this case are inconsistent with all prior federal and state agency, legislative and court determinations of that pumping. The division of the foregoing argument into small subsections in order to match the Colorado brief tends to obscure the overriding fact that the Colorado figures for precompact pumping are inherently unreasonable. According to Colorado, pumping tends to increase as one goes back toward the beginning of the 1940s, reaching a maximum amount in 1940 some fifteen

times larger than the USGS figure for that year and fifteen times higher than the figure adopted by the Colorado Supreme Court, the Colorado Water Conservation Board and the Colorado State Engineer. *See*, Rep. vol. II at 186-88. In order to achieve this outlandish result, Colorado asserted that well efficiencies were higher in the early 1940s than they were in the late 1940s, despite the fact that more efficient turbine pumps began to replace centrifugal pumps in the late 1940s. *Id.* at 189. The Master described this dubious Colorado effort as follows:

> For whatever reason, the result of the Colorado approach is to make pumping in 1940 the highest amount in the whole decade of the 1940s. This result seems questionable in light of all the earlier studies showing increasing pumping throughout the 1940s, and the new wells which continued to be drilled throughout the decade. Colorado's own report puts the number of additional wells drilled between 1941 and 1949 at 122. Jt. Ex. 94 at 19. A lower rather than higher estimate of early 1940s pumping is also supported by the fact that during the compact negotiations the engineering committee made no effort to include pumping as part of the diversion data, or indeed at all. Jt. Ex. 5 at 3. The historic division of flow between the two states was considered on the basis of surface diversions alone. Rep. vol. II at 190 (footnote omitted).

There is thus no viable basis on which to reject the Master's recommendation with respect to the precompact pumping entitlement of Colorado.

III. Increases in Stateline Flows Resulting From the 1980 Operating Plan Were Separately Bargained For and Should Not Offset Compact Violations.

Colorado challenges the Master's conclusion that the 1980 Operating Plan[22] provided both states with benefits bargained for separately from the Compact and was not intended to offset Compact violations by Colorado. Colo. Brief at 85-91.

One does not have to rely on inferences from the 1980 Operating Plan to ascertain that its intent was not to offset violations of the Compact. This intent is stated directly in Article VI:

> Adoption of this resolution does not prejudice the ability of Kansas or of any Colorado ditch to object or to otherwise represent its interest in present or future cases or controversies before the Administration or in a court of competent jurisdiction. Rep. App., Ex. 10 at App. 116.

It is hard to imagine a stronger expression of intent not to interfere with the claim of Kansas in a proceeding such as the present one. Although the Master quotes this provision in his decision, Colorado says not a word about it in its brief. *See* Colo. Brief at 85-91. Indeed, there is little that can be said to refute this unequivocal expression of intent. Likewise, neither of the other two "whereas" clauses of the 1980 Operating Plan refers even indirectly to the existence of Compact violations or to the effect of wells. *See* Rep. App., Ex. 10 at App. 116.

Colorado's suggestion that the purpose of the 1980 Operating Plan was to offset well effects is inherently implausible. Colorado alleges in the same brief in support of its exceptions that Kansas never complained about wells in Colorado until 1984. Colo. Brief at 32-63. The Colorado position has all the earmarks of a position

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[22] The 1980 Operating Plan is contained in the Appendix of the Master's Report as Exhibit 10 at App. 107.

developed after-the-fact for purposes of litigation. One can ask how the purpose now claimed for the 1980 Resolution was never even uttered by the parties in the course of their negotiation and adoption of that resolution or for years afterward. When Kansas finally became aware of the effects of the wells by virtue of the Simons, Li Report and brought that realization to the Compact Administration, Colorado denied the existence of well effects on Colorado's Compact obligations. Jt. Ex. 32 at 15, 22-23, (R. vol. 14 at 12, 22, 26), Pl. Reply App., Item 7. In fact, the 1980 Operating Plan itself was suggested by Colorado as a possible reason for the admitted decline in usable stateline flows. *Id.* at 22.

Colorado claims that general principles of contract law support its position. Colo. Brief at 90. This assertion is incorrect. Colorado claims that general principles of contract law provide that "the injured party is not entitled to recover damages which it in fact avoided." *Id.* The fundamental point that Colorado overlooks and fails to explain is that the 1980 Operating Plan is a separate agreement between the states, subject to cancellation each year, which provided independent benefits to both states.

Colorado puts much emphasis on the first "whereas" clause of the 1980 Operating Plan, which reads as follows:

> WHEREAS, the Arkansas River Compact Administration, hereinafter referred to as the Administration, recognizes that, because of changes in the regime of the Arkansas River, the present operation of the conservation features of John Martin Reservoir does not result in the most efficient utilization possible of the water under its control. Rep. App., Ex. 10 at App. 107.

Although the Colorado claim seems to be that the phrase "changes in the regime of the Arkansas River" refers to depletions by Colorado wells in violation of the Compact, the reference here would seem to be simply to the drought conditions that the Arkansas Valley was experiencing at the time. In fact, Colorado as-

sured Kansas that this was the case. Jt. Ex. 32 at 22 (R. vol. 14 at 12, 22, 26), Pl. Reply App., Item 7. As a result, as Colorado admits, "releases from John Martin for Kansas did not produce an equivalent in Stateline flow." Colo. Brief at 88. In addition to referring to the current drought conditions, the first whereas clause also refers to "efficient utilization" of the conservation features of John Martin Reservoir. This is addressed by the account system set up by the 1980 Operating Plan. Thus, the references contained in the whereas clause cited by Colorado are completely consistent with the express provisions of the 1980 Operating Plan and provide no plausible basis for Colorado's claimed, unspoken purpose asserted for the first time in this litigation. The Master concluded as follows:

> The 1980 Operating Plan provided benefits to both Kansas and Colorado which were separately bargained for. There is no evidence to support the claim that the benefits to Kansas were in settlement of its well claims. Colorado received ample consideration under the agreement for the 1980 plan without a waiver of Kansas' well claims. The benefits received by Kansas under the plan should not be offset against compact violations, and should not be a bar to any of the Kansas claims in this case. Rep. vol. II at 180-181.

Colorado has offered no persuasive reason to show that the Master is not completely correct.

IV. Kansas Should Not Be Required to Prove a Breach of the Compact by Clear and Convincing Evidence.

The Master premises his conclusion that the preponderance of the evidence burden of proof applies to the enforcement of Article IV-D in this case on the recent case of *Nebraska v. Wyoming*, 113 S. Ct. 1689 (1993). Rep. vol. I at 65-70. Colorado

challenges the Master's conclusion but curiously neglects to address the Master's reliance on that case.

In *Nebraska v. Wyoming*, the Court articulated a theretofore implicit distinction in its previous cases. A "clear and convincing" standard had developed for use in equitable apportionment cases in other interstate cases requesting injunctive relief not based on a compact. *See, e.g. Missouri v. Illinois*, 200 U.S. 496 (1906), *Colorado v. Kansas*, 320 U.S. 383 (1943). On the other hand, no such higher standard had ever been articulated or even intimated in the previous compact enforcement cases. *See, e.g., Texas v. New Mexico*, 462 U.S. 554 (1983); 482 U.S. 124 (1987); *Oklahoma v. New Mexico*, 501 U.S. 221 (1991). The Master recognized that to establish a burden of proof that was unusually high would tend to favor one state over another and violate the ideal of federalism that each state is on an equal footing with all other states. *See* Rep. vol. I at 68-69.

In *Nebraska v. Wyoming*, the Court established a clear distinction between "an application for *enforcement* of rights already recognized in the decree" and an application for "*modification* of the decree." 113 S. Ct. at 1694 (emphasis in original). Thus, if an interstate compact is at least equivalent under these circumstances to a decree of this Court, the burden of proof question would seem to be resolved in favor of the preponderance standard. The Master believed that it was. Rep. vol. I at 69-70. This would also seem to be consistent with the Court's decision in *Hinderlider v. La Plata River & Cherry Creek Ditch Co.*, 304 U.S. 92 (1938) in which the Court said:

> Whether the apportionment of the water of an interstate stream be made by compact between the upper and lower States with the consent of Congress or by a decree of this Court, the apportionment is binding upon the citizens of each State and all water claimants, even where the State had granted the water rights before it entered into the compact. 304 U.S. at 106.

Thus, compacts adopted pursuant to Article I, Section 10, Clause 3 of the Constitution are not inferior to decrees of this Court with respect to their binding nature. This would suggest that they are at least equal with respect to the closely related issue of the standard of proof necessary to show a violation. Colorado seeks to draw a distinction between a decree and a compact, however. The basis for Colorado's distinction is, essentially, that a judicial decree is created by a court proceeding and a compact is not. However, this Court in *Hinderlider* refused to make that very distinction.

Colorado cites several grounds for its position that the standard of proof should be clear and convincing. It first cites the "quality of the parties." Colo. Brief at 95. There is language in the cases as Colorado suggests; however, none of those cases involve requests for compact enforcement; rather, they involve requests for equitable apportionment or other injunctive relief in the first instance. *See*, Colo. Brief at 94-95, *quoting, e.g., Colorado v. Kansas*, 320 U.S. 383 (1943); *Washington v. Oregon*, 297 U.S. 517 (1936). Although these cases did have states as parties, the states were appearing for a very different purpose. The purpose in those cases was to consider whether there should be intervention in the rights of other states for the very first time.

Second, Colorado claims a need for the clear and convincing standard because of "the importance of a just resolution of controversies between states." Colo. Brief at 95. On the contrary, placing a higher burden on one state would eliminate the level playing field contemplated by the framers of the Constitution.

Third, Colorado claims that the clear and convincing standard is necessary "to guard against erroneous factual conclusions."*Id.* On the contrary, that standard would promote erroneous factual conclusions. The policy in favor of higher burdens in other cases is to guard against erroneous factual conclusions *against the defendant*, a policy not appropriate here in view of the equal status of states before the Court. "A preponderance-of-the-evidence standard allows both parties to 'share the risk of error in roughly equal fashion.' Any other standard expresses a

preference for one side's interests." *Herman & MacLean v. Huddleston*, 459 U.S. 375, 390 (1983) (citations omitted).

Colorado also argues that a compact can be more flexible than a decree because it can address matters which are not the subject of a present controversy, including future developments. Colo. Brief at 97. Here again, the purported distinction is not helpful. Whereas Colorado compares a decree with a compact with regard to their creation, the comparison that should be made is between the enforcement of a decree and the enforcement of a compact. Once the question is properly phrased, the Colorado distinction disappears.

Colorado criticizes the Master, saying, "[T]he Master stated the higher standard penalizes downstream states which will invariably be the party which is required to carry the burden . . . . This is not correct." Colo. Brief at 98. But Colorado has misquoted the Master. The Master's statement was actually, "Second, on an interstate stream, the downstream state will *normally* be the complaining party." Rep. vol. I at 68 (emphasis added). Not only is this generally true of interstate water controversies, *see, e.g., Kansas v. Colorado*, 185 U.S. 125 (1902); *Missouri v. Illinois*, 200 U.S. 496 (1906); *North Dakota v. Minnesota*, 263 U.S. 365 (1923); *but see Colorado v. New Mexico*, 459 U.S. 176 (1982); *Colorado v. Kansas*, 320 U.S. 383 (1943), but it is especially true of compact or decree enforcement cases. *See Texas v. New Mexico*, 462 U.S. 554 (1983); *Oklahoma v. New Mexico*, 501 U.S. 221 (1991); *Wyoming v. Colorado*, 309 U.S. 572 (1940).

Colorado cites an equitable apportionment case, *Colorado v. New Mexico*, 459 U.S. 176 (1982); 467 U.S. 310 (1984), as the basis for its criticism. Colo. Brief at 98. But the issue here is not what the burden of proof should be in a suit seeking to establish an equitable apportionment of an interstate stream, as in *Colorado v. New Mexico*. Rather, this case seeks to enforce an equitable apportionment already effected by the Arkansas River Compact. Colorado can cite no reported case in which the downstream state was not the complaining party in a suit seeking to enforce a compact. *See, e.g. Texas v. New Mexico*, 462 U.S. 554 (1983); *Okla-*

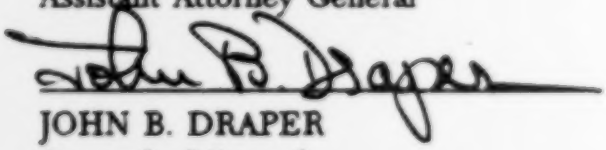
homa v. New Mexico, 501 U.S. 221 (1991). This is also true of suits to enforce interstate decrees entered by this Court. *See, e.g., Nebraska v. Wyoming*, 113 S. Ct. 1689 (1993); *Wyoming v. Colorado*, 309 U.S. 572 (1940). The downstream state will normally be the complaining state in a compact or decree enforcement action simply because of the temptation for the upstream state to withhold water that it is not entitled to. The Colorado position, if adopted, would strengthen that temptation and thereby encourage states to violate compacts—an undesirable result indeed.

CONCLUSION

Based on the foregoing, Kansas requests that Colorado's Exceptions to the Report of the Special Master be denied.

Respectfully submitted,

ROBERT T. STEPHAN
Attorney General of Kansas
JOHN W. CAMPBELL
Deputy Attorney General
LELAND E. ROLFS
Assistant Attorney General
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APPENDIX

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APPENDIX

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Reply Appendix Item 1

Excerpt from Pl. Ex. 205A

George S. Knapp Letter to W. E. Stanley,
July 13, 1940,
folders 1-3, Governor Payne Ratner Papers
Kansas State Historical Society, Topeka, Kansas
[08-15-00285] (Certified Copy)

A-7

KANSAS STATE BOARD OF AGRICULTURE

J.C. MOHLER • SECRETARY
STATE HOUSE • TOPEKA

July 13, 1940

Mr. W. E. Stanley,
830 First National Bank Building,
Wichita, Kansas.

RE: Colorado vs. Kansas

Dear Gene:-

• • • • •

I am wondering what purpose would be served by putting into a proposed consent decree a provision that no additional acreage should be put under irrigation in Colorado in the Arkansas River valley. Would it be proposed that all water above the amount needed for that acreage should be allotted to Kansas or be considered as surplus to be divided in some manner between Colorado and Kansas? While Colorado might refrain from constructing additional ditches for new projects yet there are many ways in which their people could increase their use of water, and even the actual number of acres irrigated, without Kansas being able to show that that was done unless an examination of the acreage actually irrigated was made each year. Many of the farmers in the Arkansas River basin do not have sufficient water to irrigate all of the farm each year and, consequently, one field is watered one year and another the next. If water could be obtained, the user could materially increase the acreage actually irrigated without the state engineer's and census reports showing any increase

in irrigated acreage. In addition to that many water users can, and in recent years have, materially increase their use of water without increasing ditch diversions by the construction of pumping plants which pump water from wells on individual farms or even pump into some of the ditches and thus they use more water on the land than head-gate deliveries show. Pumping depletes the ground water reservior and intercepts return flow which would become stream flow if not intercepted. Where extensive pumping lowers the reservoir below stream bed, stream flow sinks into the bed to recharge it, thus pumping imposes an additional but unmeasured burden on the water supply.

• • • • •

Reply Appendix Item 2

Excerpt from Pl. Ex. 514

**Supreme Court of Colorado,
Case No. 27738, *Kuiper v. AT&SF Railway*,
Amendments to the Rules and Regulations on the
Arkansas River, Transcript of
Testimony March 1975, District Ct.,
Water Div. No. 2, Cases Nos. W-4079 et al., 1011 pp.**

• • • • •

[Vol. I, pp 213-14]

[Direct Testimony of Dr. Danielson]
[S]o that if you will look at page 22 [Pl. Reply App., Item 9] of exhibit I [the 1975 Colorado State Engineer Report, Jt. Ex. 94 in No. 105, Orig.] you will find there listed by year, first the year and then the total electric power consumed and these records were taken both from the U.S.G.S. and from Colorado State University which more or less collects and correlates these power records, and, then, the estimate of total water pumped in terms of thousands of acre feet, and the footnote explains what I just went through, ...

• • • • •

Q. In 1972 on page 22 it appears that the total water pumped exceeds 200,000 acre feet.

A. Yes, that is correct.

• • • • •

Reply Appendix Item 3

Colo. Ex. 57

Letter dated April 10, 1951, from Hans Kramer, Chairman and Representative of the United States, Arkansas River Compact Administration, to Col. Charles H. McNutt, District Engineer, U.S. Army Corps of Engineers.

COPY

220 Bush Street
San Francisco 4, California
ARKANSAS RIVER COMPACT ADMINISTRATION
Lamar, Colorado

April 10, 1951

Colonel Charles H. McNutt, C.E.
District Engineer
Corps of Engineers, U.S. Army
P.O. Box 1538
Albuquerque, New Mexico

My Dear Colonel:

This will acknowledge receipt of letter from your office dated 5 April 1951, File SWKGC, regarding the availability of the final operation studies of John Martin Reservoir which were made for the consummation of the Colorado-Kansas-Arkansas River Compact. Your communication is the result of previous correspondence with Judge Stone, he having furnished me a copy of his letter to you dated March 29, 1951.

I appreciate fully the policy of your office to coordinate basic criteria used in studies for new project planning with those used in the formulation of existing compacts. However, in the case of the Arkansas River Compact no final operation studies of John Martin Reservoir were actually made, nor did any of the engineering compilations that were made during the negotiation of the Compact enter into the ultimate wording. Hence, strictly speaking, "the final operation studies" referred to in your letter are non-existent.

Perhaps it would help toward understanding the preceding statement, if I were to trace just what was done in the way of

engineering studies during the negotiation of the Arkansas River Compact. The Commission's Committee on Engineering Data and Studies (of which I was chairman) undertook initially (1) to assemble pertinent engineering data upon which the engineers would be in full agreement and (2) to make engineering analyses upon which the Commission could rely in formulating a compact. This assignment, on which work was started in 1946, was predicated on the initial assumption that some fixed criteria for operating John Martin Reservoir would have to be agreed upon as a basis for the Compact, it being the initial objective of the Engineering Committee to analyze and evaluate the results obtained from various hypotheses. In organizing the work of the Engineering Committee, it was contemplated that its final report would consist of three main parts, viz. I—Engineering Data; II—Analysis of Historic Flow; III—Operation Studies.

In the execution of that program the Committee submitted its First Interim Report on June 26, 1947. This report, dealing only with Part I, consisted principally of a series of tables of pertinent stream flow and diversion data compiled from various sources (e.g., U.S.G.S., State Engineers) for

convenient reference. It also included engineering data on John Martin Reservoir from which some evapo-transpiration and siltation estimates were computed.

A Second Interim Report, also on Part I, was submitted on November 24, 1947. This report merely rounded out the First Interim Report with respect to stream flow, diversion and storage records by including the period 1943-1946 during which the then partially completed John Martin Reservoir had operated. It also presented some calculated data on accretions for the periods 1908-1942 and 1943-1946.

ies that were mentioned in Judge Stone's letter. These studies had no bearing or subsequent formulation of the Compact.

Neither of the two Interim Reports was ever released for public use nor were they included in the Official Record of the Commission, it having been the prevailing thought that publication would be in the form of a final report which would include operation studies, if and when such a final report were made.

However, even before the date of the Second Interim Report, the trend of the negotiations took a decided turn away from the concept of fixed operating conditions based on firm interstate allocations toward the more flexible philosophy, best described as "live and let live," which became the basis of the ultimate-Compact. That principle, which was an outgrowth of the Interim Executive Agreement between Colorado and Kansas governing the operation of John Martin Reservoir during the period of compact negotiations, permitted either State to obtain water from John Martin Reservoir (when stored water was available) without regard to the other State and without the need for keeping books to balance hypothetical debits and credits. Further background details of this evolution are obtainable from careful study of the Official Record of the Colorado-Kansas-Arkansas River Compact Commission, particularly the 7th, 8th, 9th and 10th meetings. A copy of this Record was furnished to your office on February 14, 1950.

With agreement upon a flexible and indeterminate basis of interstate apportionment, it was obvious that operation studies of John Martin Reservoir could serve no useful purpose in spelling out the terms of the compact, if indeed such studies were practicable under the circumstances. Accordingly, operating studies were dispensed with then and there and that phase of the work of the Engineering Committee was suspended after the rendition of its Second Interim Report. No "Final Report" was ever made. Thus, as stated earlier in this letter, no final operation studies were authored by the Compact Commission. By the same token, such studies and/or analyses as were undertaken in the earlier stages of compact negotiation (when fixed allocations were pre-

supposed) are manifestly worthless for current consideration in relation to the terms of the Compact that was actually consummated.

Colonel Charles H. McNutt - 3 - April 10, 1951

Let me assure you that the above explanation, lengthy and detailed though it is, is not intended in any way to deny your office access to any available material that may be helpful to you. My explanation is intended merely to support the warning in Judge Stone's letter that unoriented and injudicious use of such material might be not only a waste of effort but could lead to erroneous or confused results. On the other hand, it may well be that some of the tabulations of existing data which were compiled in the Interim Reports could be useful in your current studies if brought up to date by your office.

It occurs to me that the most satisfactory way to arrive at a clear and complete mutual understanding of this matter is for the principal parties to get their feet under and their heads together over the same table. To that end I would suggest a get-together, preferably in Judge Stone's office in Denver where the Interim Reports and other material are on file. In addition to representatives of your office and myself such a conference should include Mr. R. M. Gildersleeve, who worked closely with the Commission's Engineering Committee and Mr. D.C. Bondurant, formerly of your office and now in the Missouri River Division, who actively assisted me on the Committee and who is not only well acquainted with the evolution of the Compact, but had intimate knowledge, in his former capacity, of its impact on studies for new projects in the Arkansas Basin. From my viewpoint such a huddle is the best procedure toward obtaining the desired coordination of studies.

I expect to be in Denver in connection with other business on Monday, April 30, 1951, and would be glad to reserve my time from 10:00 a.m. to 2:00 p.m. for a conference as suggested above.

If you deem such a meeting advisable please have your office issue invitations to those concerned.

Sincerely yours,

Hans Kramer
Chairman and Representative of the United States
Arkansas River Compact Administration

cc: Judge Clifford H. Stone
Mr. Robert V. Smrha

Reply Appendix Item 4

Excerpt from Def. Ex. 623

Patterson, C.L. Program for the Improvement of Irrigated Agriculture in the Arkansas Valley in Colorado (Feb. 1932)

[29-30]

• • • • •

Ground Waters.

As has been explained, surface water and ground water are so intimately and directly related, that it is wrong to consider them separately. But because it is customary, that plan has been pursued.

Many of the recent irrigation developments have involved the use of ground waters, some projects being of the drainage type, and many of them involving pumping plants. In the Arkansas Valley there are dozens and perhaps hundreds of irrigation pumping plants, few of which have observed the existing regulations regarding the filing of maps and statements of claim or have rights established by adjudication, or which operate with any administrative recognition. New projects are being promoted and constructed, and as water values increase, the confusion will be multiplied still further. The uncertainty as to the future status of stream flow rights is increasing. The negative public policy is promoting conflict and litigation. Other unfortunate features are the fact that investments have been and are being made some of which may be destroyed, and that no proper legal status is being established under which these possibilities of reclamation may attain the value and permanence they may deserve.

• • • • •

Reply Appendix Item 5

Excerpt from Jt. Ex. 5

Interim Report of Committee on Engineering Data and Studies to Colorado-Kansas Arkansas River Compact Commission (June 26, 1947)

[3]

• • • • •

To evaluate the resulting effects of operations of John Martin Reservoir, determinations and definitions of the water supply and diversion conditions and relations that historically prevailed along the Arkansas River in Colorado Water Districts 14, 17 and 67, and in Kansas between the Stateline and Garden City, are necessary. Unnecessary data not included in the attached tabulations are streamflow at stations on the Arkansas River upstream from Canon City in Colorado, and downstream from Garden City, in Kansas, and at stations on all tributary streams other than the Purgatoire River near its mouth. Also not included are the diversions by ditches from the Arkansas River in Colorado Water Districts 11 and 12, upstream from the western boundary of Pueblo County, and by ditches from all tributaries of the Arkansas River. Irrigation supplies derived from pumps in both States are not included in the tabulated diversions.

• • • • •

Reply Appendix Item 6

Excerpt from Jt. Ex. 19

Minutes of meetings of the Arkansas River Compact Administration from 1949 through December, 1984

MINUTES OF
ARKANSAS RIVER COMPACT ADMINISTRATION
ANNUAL MEETING
December 14, 1954
LAMAR, COLORADO

Attendance -
For Colorado:

Ivan C. Crawford, Denver; Director Colorado Water Conservation Board
Harry B. Mendenhall, Rocky Ford; Chairman of Colorado Representatives
Harry C. Nevius, Lamar; Administration Secretary and Treasurer

For Kansas:

Wm. E. Leavitt, Garden City.
R. V. Smrha, Topeka.
Roland H. Tate, Garden City, Vice Chairman & Chairman of Kansas Representatives

For the United States:

Brig. Gen. Hans Kramer, San Francisco, Calif.; Chairman of the Administration

• • • • •

[13-14]

General Kramer said that the basic motivating principle in formulation of the Compact was, "Live and Let Live". In December 1948 the final discussion on Article IV-D was held. At that time Commissioner Mendenhall suggested a review and asked for a

change in wording. The word "material" was inserted after that discussion and the decision to insert the word was to eliminate too rigid interpretation.

General Kramer quoted pertinent passages from the Record (pp 17- 32,33).

General Kramer said, after listening to all the discussion and studying the matter from the viewpoint of the intent of those who wrote the Compact, that he considers the amount of depletion to be not material. However, if, for the sake of discussion, it should be presumed that the 530 Acre Feet average depletion is material, then too, the amount of 65 Acre Feet average sediment reduction must likewise be considered material. This would mean to the United States that the life of the Reservoir, from this point of view, will be 50 years longer or an equivalent of 1 to 2 percent. The whole question resolves itself to, "Is the amount material?" The suggestion that the Golden Rule and the principle of "Live and Let Live" be adhered to was stressed by General Kramer as his closing remark.

General Kramer then resumed the Chair.

Judge Tate said he would like to make a statement on behalf of the Kansas position. He and his co-workers on the Administration as the Kansas delegation concur fully with Governor Arn and they have no desire to deviate from his views as expressed in his letter of August 8, 1954 to the Chief of Engineers. With reference to the averages spoken of, they may be relatively unimportant, however, there are times when they may become material. Kansas thinks that there may be ways to relieve the depletion by operation in District 67 and other upstream users. He believes that the depletion should be absorbed entirely by Colorado's portion of the river—not District 67 and Kansas alone.

• • • • •

Mr. Smrha moved: The Administration does not approve, at this time, the Project as proposed by the Corps of Engineers on the Purgatoire River.

Mr. Nevius seconded the motion remarking that his main concern was the plan of operation and the effect that it might have on the area below the Project.

Mr. Crawford stated that he was emphatically opposed to the motion. He felt that its passage would be, in effect, closing the door on future development of the Arkansas basin above John Martin Reservoir. He said he believed that action today might save life and property in upstream communities.

Chairman Kramer stated that it was not incumbent upon the Administration to make comments either way, and that the matter could be tabled, if desired.

Mr. Tate reviewed the action taken by the Administration in past meetings. He agreed with General Kramer that the U. S. Representative should make a report to the Government and that the Corps of Engineers should be advised of the Administration's views.

A brief discussion on a parlimentary matter ensued followed by a short recess.

• • • • •

Upon reconvening, Chairman Kramer asked if further discussion was desired on Mr. Smrha's motion.

On vote, Colorado voted Aye with Mr. Crawford dissenting. Kansas voted Aye, and the motion was declared passed.

Chairman Kramer again reminded the Administration of the next scheduled regular meeting of March 22, 1955.

The meeting adjourned at 2:45 P. M.

• • • • •

The above minutes were approved by action of the Administration March 22, 1955.

Hans Kramer (Brig. Gen. U.S.A.-Ret.)
Administration Chairman

Harry C. Nevius,
Administration Secretary

Reply Appendix Item 7

Excerpt from Jt. Ex. 32

**McDonald, J. William, Memorandum to
Arkansas River
Compact Administration re ARCA Investigation
(October 4, 1985)**

[15]

• • • • •

c. Previous Well Studies.

Third, the Kansas' engineering consultants stated that previous investigations of well pumping in Colorado demonstrated that well diversions had depleted surface streamflows. The problem with the previous studies cited by the Kansas engineering consultants is that the theoretical depletions from well depletions are not reflected in actual streamflow records. For example, the single and double-mass diagrams involving the flows of the Arkansas River at Las Animas and usable stateline flows prepared for this investigation do not show a gradual change in slope that would reflect depletions caused by well pumping. Instead, the curves of the Arkansas River at Las Animas have fairly constant slopes. The curves involving usable stateline flows show a sharp break downward beginning in 1974 and continuing through 1979 and then a break upward beginning in 1980. This corresponds to the decline in tributary inflow, rather than to well development in Colorado.

• • • • •

[22-23]

D. Pre- and Post-Compact Flows of the Arkansas River at Las Animas.

Mr. Pope also concluded that the flow of the Arkansas River at Las Animas had declined during the period 1949-1973 as compared to the precompact period. (Pope Report, p. 22, §5). However, I believe that Mr. Pope and I are in agreement that this decline is explained by the change in water rights administration

in Colorado when there is water in the conservation pool in John Martin Reservoir. (p. 10).

II. Matters for Further Investigation

As noted above, both reports are in general agreement that the changes in relationship shown by the double-mass curves occurring since 1974 have been below the Las Animas gage on the Arkansas River. This isolates the reach appropriate for further investigation.

In my opinion, plains precipitation during the period 1974-1982 is a matter that warrants further investigation. In addition, tributary inflow from plains drainage areas may have declined during the period 1974-1979 as the result of soil conservation measures. Such conservation measures were found to have had a substantial effect on streamflow in the Republican River Basin. If, after an investigation of the factors which appear most likely to have caused the decline in usable stateline flows during the period 1974-1982, including: 1) reduced diversions by ditches in Colorado Water District 67; 2) the operating plan for John Martin Reservoir; 3) decreased plains precipitation; and 4) soil conservation measures, it does not appear that this decline can be entirely attributed to such factors, then a further investigation of possible causes may be justified. However, at this time, I cannot agree to undertake an investigation into well development in Colorado when the single and double-mass diagrams do not suggest that well development in Colorado has had an impact on usable stateline flows.

Reply Appendix Item 8

Excerpt from Jt. Ex. 88

Simons, Li and Associates, Inc., 1984.
Preliminary Assessment, Development
and Administration
of Water Resources in the Arkansas River Valley

[iv-v]

• • • • •

V. Conclusions and Recommendations

Major conclusions from this investigation are:

1. The Arkansas River Compact entitles Kansas to the pre-compact usable stateline flows and a 40 percent share of the conservation benefits resulting from the construction and operation of John Martin Reservoir.

2. Usable stateline flows *increased* slightly after the compact until about 1973. Since 1974, however, usable flows have *declined* to about 45 percent of pre-compact values. This has resulted in *material depletion* of Kansas ditch diversions.

3. Post-compact well development in Colorado has caused approximately 150,000 acre-feet per year of depletions to the Arkansas River. It is likely that depletion associated with Colorado well development is a major cause of *decline* in usable stateline flows.

4. Operation of the Trinidad Project since 1979 has caused 26,000 to 35,000 acre-feet of depletions in excess of those which would have resulted from the operation approved by the Compact Administration.

5. Kansas' entitlement to usable quantities of water under the Arkansas River Compact has been *materially depleted* by post-compact development in Colorado. A conservatively low estimate of this depletion for the period of 1974 to 1981 is 40,000 to 50,000 acre-feet per year.

The major recommendations for further study are:

1. The findings of this preliminary assessment should be verified, including additional comparisons of pre- and post-compact use in Colorado.

2. The operation of the Trinidad Project should be analyzed in more detail.

3. Colorado well development and its effect on Kansas should be further documented and analyzed.

4. The operation of the Pueblo Reservoir winter water storage program should be reviewed and studied to determine if the program has or is causing an adverse impact to the State of Kansas.

5. The operation of John Martin Reservoir should be evaluated to determine the long term effect of the 1980 Storage Resolution.

6. Potential mechanisms to mitigate material depletion to the compact entitlement of the State of Kansas should be developed.

• • • • •

[1.1]

I. INTRODUCTION

1.1 *Scope and Nature of Study*

Simons, Li & Associates, Inc. (SLA) was authorized to conduct a water resources investigation of the Arkansas River basin by the State of Kansas, Office of the Attorney General in September 1983. This report describes the preliminary study of flow conditions of the Arkansas River basin since the signing of the Ar-

kansas River Compact by the States of Colorado and Kansas in late 1948. The purpose of this study was to compile and evaluate information necessary to determine if the State of Kansas has sustained material injury under the terms and conditions of the compact.

The scope of work for this study is summarized below as excerpted from the contract for professional services between SLA (Second Party) and the State of Kansas (First Party) dated September 26, 1983:

1. Second Party hereby agrees to perform a study and provide a written report via First Party to the Kansas Legislature. Such report shall contain the opinion of a qualified expert as to whether there is probable cause to believe that since the year 1949 the development of the Arkansas River basin in Colorado by federal and/or state agencies, by private enterprise, or by combinations thereof, which may involve construction of dams, reservoirs, or other works for the purpose of water irrigation and control, as well as the improvement and prolonged functioning of work already existing, has materially depleted in usable quantity or availability water for the water users in Colorado and Kansas. In addition, Second Party hereby agrees to include in said report an evaluation of the current and past operating procedures utilized at the Trinidad Dam and Reservoir project in Trinidad, Colorado. In addition, Second Party hereby agrees to include in the above-mentioned report a statement concerning whether any said depletion has resulted in material injury to the State of Kansas.

2. Second Party hereby agrees to provide a summary of the factual basis for any opinion expressed by any expert in the above-mentioned report.

• • • • •

Reply Appendix Item 9

Excerpt from Jt. Ex. 94

Stream Depletion by Wells in the Arkansas River Basin — Colorado, 1975, Office of the State Engineer

Year	Total Electric Power Consumed (M.KWH.)	Total Water Pumped (1000 AF)	Year	Total Electric Power Consumed (M. KWH.)	Total Water Pumped (1000 AF)
1940	1.243	2.5	1957	5.788	84
1941	0.6	5	1958	7.024	79
1942	0.358	6.5	1959	11.223	153.5
1943	0.831	7	1960	11.486	146
1944	0.459	9	1961	9.627	121
1945	0.590	9.5	1962	11.070	132
1946	1.749	15	1963	20.781	177.9
1947	1.207	15	1964	23.252	192.9
1948	1.234	15	1965	12.990	120.1
1949	2.193	23.5	1966	16.733	138.8
1950	3.492	31	1967	16.734	140.3
1951	3.483	31	1968	18.287	161.1
1952	4.518	46	1969	13.962	119
1953	6.090	58	1970	15.576	132
1954	9.336	94	1971	22.008	183.7
1955	9.382	97.5	1972	25.080	208.3
1956	11.925	152			

TABLE 7. Ground Water Withdrawal by Irrigation Wells—Arkansas River (Canon City to State Line)

Source:

1940-1962 From USGS basic data release no. 21

1963-1968 From USGS basic data release no. 21 plus estimates for San Isabel elec. co. using regression equation $Y = 8.0322E + 6.897$, Y = GW withdrawal (1000 AF) E = elec. power consumed (M.KW)

1969-1973 Estimated using regression equation. This eqn. is based on USGS data (Basic data release 21) and power data (CSU)

• • • • •

[53]

CONCLUSIONS

The increasing use of ground water for irrigation in the Arkansas River basin since 1950 has affected stream flows in such a way as to deprive senior water users of a portion of their lawful water supply. This study has conclusively shown by means of a water budget analysis and mass diagrams that excessive pumping from the Arkansas River alluvium has resulted in the following:

1) Decrease in stream flows below Canon City;
2) Decrease in the quantity of water diverted from the main stem of the Arkansas River;
3) Reduction in return flows as indicated by a decrease in the river gain between Canon City and the State line.

The "Net River Gain" section of this report indicates that the decrease in diversions and return flows is equivalent to the consumptive use of well water, which from 1965 through 1972 average 112,800 Ac-Ft per year. This amount is obviously significant and of such a magnitude that the restoration of the value of the senior water right to its pre-well development level is warranted. This does not necessarily spell doom for the well users in that water management schemes can be devised that will prevent injury to senior surface water users while at the same time allowing continued ground water withdrawals.

• • • • •

Reply Appendix Item 10

Excerpt from Jt. Ex. 139

**Barker, R.A., L.E. Dunlap, and C.G. Sauer, 1983.
Analysis and Computer Simulation of
Stream Aquifer Hydrology,
Arkansas River Valley, Southwestern Kansas.
U.S. Geological Survey, Water-Supply Paper 2200.**

• • • • •

[55]

Results of model experimentation with hypothetical 1970-79 conditions show that water levels and streamflow within the study area were more directly affected by the reductions in incoming streamflow (compared to 1951-69 average conditions) than by either the smaller than average amounts of annual precipitation or the increased pumpage during the 1970's. Simulation indicates that: (1) The effects of less recharge during periods of smaller than average amounts of precipitation were offset by more recharge during brief periods when precipitation was much greater than the mean monthly amount and (2) the effects of the increased pumpage were partly offset by increased recharge resulting from increased irrigation.

• • • • •

Reply Appendix Item 11

Excerpt from Transcript vol. 10

(Cross-examination of Douglas Littlefield)

[42-43]

• • • • •

Q. DO YOU KNOW IF MR. PATTERSON PREPARED A REPORT THAT DEALT WITH GROUND WATER IN THE ARKANSAS RIVER VALLEY IN THE EARLY 1930S?

A. I'M UNFAMILIAR WITH THE REPORT.

Q. I WOULD LIKE TO HAND YOU WHAT HAS BEEN MARKED AS DEFENDANT'S EXHIBIT 623 AND ASK YOU IF YOU CAN IDENTIFY IT.

A. THIS IS A REPORT BY C.L. PATTERSON, CONSULTING ENGINEER, ENTITLED "PROGRAM FOR THE IMPROVEMENT OF IRRIGATED AGRICULTURE IN THE ARKANSAS VALLEY IN COLORADO." IT IS DATED FEBRUARY, 1932. AND APPARENTLY YOU OBTAINED A COPY OF THIS FROM MY FILES DURING MY DEPOSITION, BECAUSE THE FRONT PAGE HAS A COPY OF MY FILE FOLDER HEADINGS.

Q. DO YOU RECALL REVIEWING THIS REPORT?

A. I DON'T RECALL REVIEWING IT. I'M CERTAIN THAT I LOOKED THROUGH IT AT SOME POINT.

Q. IS THIS ONE OF THE DOCUMENTS YOU HAD COPIED AT THE COLORADO STATE HISTORICAL SOCIETY?

A. YES. THIS APPARENTLY IS FROM THE ARKANSAS VALLEY DITCH ASSOCIATION PAPERS.

• • • • •

[46-47]

• • • • •

Q. DOESN'T IT APPEAR FROM THIS REPORT THAT THERE WAS A GREAT DEAL OF CONFUSION ABOUT THE NATURE OF RIGHTS TO GROUND WATER AMONG COLORADO WATERS USERS AT THIS TIME?

A. THAT CERTAINLY WOULD BE A FAIR CONCLUSION, YES.

Q. DO YOU HAVE ANY REASON TO BELIEVE THAT THIS CONFUSION WAS ANY LESS IN THE 1940S?

A. I DON'T — HAVE NO WAY OF KNOWING.

• • • • •

Reply Appendix Item 12

Excerpt from R. vol. 63

April 16, 1991
(Direct Examination of Robert Longenbaugh)

[189-90]

• • • • •

Q. ARE YOU FAMILIAR WITH THE PRACTICES OF FARMERS IN THE ARKANSAS VALLEY RELATED TO OPERATION OF IRRIGATION PUMPING PLANTS?
A. YES, I AM.
Q. WHAT IS THE BASIS OF YOUR KNOWLEDGE?
A. MY BASIS IS SERVING AS EXTENSION IRRIGATION SPECIALIST THROUGHOUT THE '70S, AND ALSO THE FACT THAT I MEASURED OBSERVATION WELL NETWORK THROUGHOUT THE VALLEY IN THE '60S. AND IN ADDITION, THE STUDIES THAT WERE DONE WITH COLORADO STATE UNIVERSITY AND THE U.S.G.S. IN THE PERIOD 1962 THROUGH '64 AND '65.
Q. I ASKED YOU ABOUT THIS PREVIOUSLY, BUT WHAT IS YOUR OPINION CONCERNING THE AVERAGE EFFICIENCY OF PUMPING PLANTS IN THE ARKANSAS VALLEY?
A. I WOULD SAY THAT I WOULD EXPECT A VALLEY WIDE AVERAGE TO BE 40 TO 45 PERCENT.
Q. HAVE THEY CHANGED —
A. THAT WOULD BE 1985 CONDITIONS.
Q. HAVE THEY CHANGED OVER TIME?
A. YES, THEY HAVE.
Q. WHAT CHANGES HAVE OCCURRED?
A. THEY HAVE DECREASED IN EFFICIENCY OVER TIME BECAUSE OF THE WEAR OF THE PUMP AND THAT THEY DON'T CHANGE OUT THE PUMPS. SO THE AGE OF THE PUMPS IN MY OPINION IS OLDER EVERY YEAR, AVERAGE AGE OF THE PUMPS IN THE VALLEY.

• • • • •

Reply Appendix Item 13

Excerpt from R. vol. 65

April 18, 1991
(Cross-examination of Robert Longenbaugh)

[69-70]

• • • • •

Q. BUT AT SOME POINT IT WILL HAVE TO BE CHANGED; IS THAT RIGHT?

A. I DON'T KNOW. WE HAVE GOT PUMPS DOWN THERE NOW, MR. DRAPER, THAT ARE — WHEN THEY ARE SERVICED, I SAW AND OBSERVED PUMPS IN MY FIELD TRIP IN JUNE WHEN THE DISCHARGE PIPE HERE JUST SPEWING WATER EVERYWHERE, COMPLETELY RUSTED OUT. HOW A FARMER CAN NOT BE DOING WHAT HE SHOULD BE DOING AND WASTING THAT MUCH WATER, I DON'T UNDERSTAND.

WHEN YOU PULL PUMPS AND COLUMN PIPE OUT, IT IS NOT UNCOMMON TO FIND COLUMN PIPE HAVING HOLES IN THE SIDES. THE WATER SQUIRTS OUT THROUGH THE BOTTOM OF THE PUMP, GOES DOWN THE WELL CASING. I HAVE MADE PUMP EFFICIENCY TESTS OF 5 PERCENT, 5 PERCENT EFFICIENCY, 10 PERCENT EFFICIENCY. AND, YES, I CAN HOPE WE GET THE FARMERS INTERESTED IN CHANGING IT OUT. I CAN'T GUARANTEE YOU THAT, EITHER.

• • • • •

Reply Appendix Item 14

Excerpts from Transcript vol. 77

(Direct Examination of Jeris Danielson)

[30-31]

• • • • •

Q. IS YOUR ANALYSIS HERE, WITH RESPECT TO THE EFFECTS OF PUMPING, WAS THAT BASED ON THE ACTUAL PUMPING AMOUNTS OR ON THE DECREED AMOUNTS FOR WELLS?
A. I BELIEVE THE CALCULATION WAS BASED ON THE PUMPING AMOUNTS SHOWN IN TABLE 7 AT PAGE 22 [of Jt. Ex. 94, Reply App., Item 9.]
Q. IN OTHER WORDS, THE ACTUAL PUMPING AMOUNTS?
A. WELL, I CAN'T SAY "ACTUAL." I AM NOT SURE WE KNOW THE ACTUAL. I THINK THE VALUES THERE — IF YOU LOOK AT THE FOOTNOTE IN THE TABLE — INDICATES SOURCES AND TECHNIQUES OF ESTIMATES. SO I WOULD NOT REPRESENT TO YOU THAT THESE ARE THE ACTUAL PUMPING. THESE WERE THE BEST THAT MY STAFF COULD DETERMINE IN 1972.
Q. OF ACTUAL PUMPING?
A. OF ESTIMATED PUMPING, YES.
Q. THESE ARE NOT THE DECREED AMOUNTS FOR THE WELLS IN THE VALLEY; IS THAT RIGHT?
A. I DON'T BELIEVE SO, NO.

• • • • •

Reply Appendix Item 15

Excerpt from R. vol. 78

May 16, 1991
(Cross-examination of Jeris Danielson)

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[85]

Q. OKAY. ON PAGE 53 [of Jt. Ex. 94, Reply App. Item 9], MR. DRAPER ASKED YOU SEVERAL QUESTIONS ABOUT THE THREE CONCLUSIONS SET FORTH ON PAGE 53. DO YOU STILL AGREE WITH THOSE CONCLUSIONS?

A. YES.

Q. LOOKING AT THE SENTENCE WHICH FOLLOWS THE THREE CONCLUSIONS, "THE REPORT INDICATES THAT THE DECREASE IN DIVERSIONS AND RETURN FLOWS IS EQUIVALENT TO THE CONSUMPTIVE USE OF WELL WATER, WHICH FROM 1965 THROUGH 1972 WAS SAID TO AVERAGE 112,800 ACRE FEET PLUS PHREATOPHYTE LOSSES."

DOES THE DECREASE IN DIVERSIONS AND RETURN FLOWS TRANSLATE INTO A REDUCTION IN STATE LINE FLOWS IN YOUR OPINION?

A. NO, NOT IN THE EVALUATION THAT WE DID IN THIS REPORT.

Q. WHY NOT?

A. BECAUSE THE EVALUATION WAS COMPLETED IN '72, WE WERE LOOKING AT LOSS OF RETURN FLOW — OR THE DIMINISHMENT IN NET RIVER GAIN, IT'S A LUMP TERM — IN THE REACH AND NOT EXAMINED AT THE STATE LINE. AGAIN, INSOFAR AS THERE MAY HAVE BEEN WELLS IN 1972 PRODUCING BELOW THE BUFFALO HEADGATE, IT IS CONCEIVABLE THAT THOSE WELLS COULD HAVE AT TIMES CAUSED A DECREASE IN STATE LINE FLOW. WE DID NOT MAKE THAT DETERMINATION.

• • • • •

Reply Appendix Item 16

Excerpt from R. vol. 84

May 24, 1991
(Direct Examination of Duane Helton)

[24-26]

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MR. DRAPER: LET ME JUST MAKE ONE POINT IN THAT REGARD, YOUR HONOR. I THINK THE REFERENCE THAT MR. ROBBINS MAKES TO THE ESTABLISHED RIGHTS UNDER THE COLORADO COURTS THAT WERE ENTERED MANY, MANY YEARS AFTER THESE RIGHTS MAY HAVE BEEN FIRST USED. WHEN THEY WERE ENTERED WITH A CERTAIN PRIORITY DATE, THEY WERE NOT GRANTED THE RIGHT TO PUMP OUT OF PRIORITY, WHICH IS WHAT THEY'VE BEEN DOING. IF THEY HAD, LET'S SAY, A 1947 PRIORITY DATE, THOSE WELLS HAVE NOT BEEN KEPT IN THAT NITCH IN THE PRIORITY SYSTEM. THEY HAVE BEEN LIKE A FIRST PRIORITY ON THE SYSTEMS THAT CAN TAKE OUT EVEN THE ROCKY FORD DITCH BECAUSE THEY PUMP UNREGULATED. AND I THINK IN THIS DISCUSSION OF LEGAL POINTS, IT'S APPROPRIATE FOR THE COURT TO KEEP THAT IN MIND.

SPECIAL MASTER: ALL RIGHT.

MR. ROBBINS: YOU'VE HEARD DR. DANIELSON'S TESTIMONY AND YOU'LL CERTAINLY HEAR MORE LEGAL ARGUMENT FROM ME ON THAT POINT, BUT AT THE BOTTOM LINE, THE COMPACT ALLOCATED THE RESOURCE BETWEEN TWO STATES ON A CERTAIN DATE AND COLORADO CITIZENS WHO HAPPENED TO BE TAKING FROM THE GROUND WATER SYSTEM AT THAT TIME, WHO HAPPENED TO HAVE BEEN PUMPING AT THAT TIME AND WHO WEREN'T AT THAT TIME ABLE EVEN TO GET A DECREE FOR THEIR GROUND WATER RESOURCES, THE FACT THAT THEIR OPPORTUNITY DIDN'T ARISE UNTIL

LATER SHOULDN'T BE TO THEIR DETRIMENT OR TO THEIR PREJUDICE.

AND THE QUESTION OF HOW COLORADO'S DITCHES AFFECT ONE ANOTHER, THE PRE-1900 DITCHES AND THE POST COMPACT 1900 WELLS, IS PROBABLY — IS AN ISSUE THAT COLORADO HAS BEEN WRESTLING WITH FOR 30 YEARS AND IS NOT AN ISSUE THAT ACCRUES TO KANSAS'S BENEFIT.

THEY ARE VERY MUCH LIKE, AT THE BANQUET, THE ANIMALS THAT GET AROUND THE TABLE, AND THEY WANT THE SCRAPS THAT FALL OFF, AND I DON'T THINK THAT THAT'S THE PURPOSE OF THIS PROCEDURE. I THINK THAT COLORADO WATER USERS WHO HAVE PRE-COMPACT WATER RIGHTS ARE ENTITLED TO THEIR PROTECTION.

SPECIAL MASTER: LET'S GIVE MR. DRAPER ONE COMMENT AND THEN LET'S NOT HAVE ANYMORE ARGUMENT AT THIS POINT.

IT IS CLEAR THAT INVOLVED IN THE PUMPING ANALYSIS, THAT THE WHAT IF PUMPING ANALYSIS IS A CERTAIN APPROACH WITH RESPECT TO THE PRE-COMPACT WELLS, AND THAT'S ONE OF THE THINGS THAT I WILL ULTIMATELY HAVE TO APPLY THE LAW TO AND TO ANALYZE AND TO REACH A DETERMINATION ON, AND SO I THINK THIS POINT, I DON'T REALLY NEED TO HAVE A LOT OF ARGUMENT ON IT. I SIMPLY NEED TO UNDERSTAND WHAT HAS BEEN DONE AND I THINK I DO THAT.

BUT YOU GET ONE LAST COMMENT, MR. DRAPER.

MR. DRAPER: THANK YOU, YOUR HONOR, I'LL KEEP IT SHORT.

WHEN WE PASS OVER TO WHAT AMOUNT OF PUMPING OUGHT TO BE GRANDFATHERED UNDER THE COMPACT, OUR POSITION IS THAT IT'S WHAT PUMPING WAS AFFECTING THE RIVER AT THE TIME

OF THE COMPACT. AND COLORADO, UNDER THE GUISE OF THESE DECREES, MOST OF WHICH WERE ENTERED WITHOUT OPPOSITION MANY YEARS LATER, THEIR POSITION IS THEY CAN INCREASE BEYOND THAT, INCREASE THE EFFECTS ON THE RIVER, AND I DON'T THINK THAT WAS THE INTENTION OF THE FRAMEWORK OF THE COMPACT.

SPECIAL MASTER: I THINK I UNDERSTAND KANSAS'S ARGUMENTS AND COLORADO'S.

MR. ROBBINS: BEFORE THINGS GET TOO FAR DOWN THE ROAD, THOUGH, I WANT MAKE IT CLEAR THAT THE INSINUATION THAT SOMEHOW SOMETHING IMPROPER WAS DONE IN A COURT OF LAW IN COLORADO ISN'T APPROPRIATE, YOUR HONOR, BECAUSE THE SUGGESTION IS THERE HAS BEEN A FRAUD PERPETRATED UPON THE COMPACT.

• • • • •

Reply Appendix Item 17

Excerpts from Transcript vol. 125

(Direct Examination of Dale Book)

[59-61]

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SPECIAL MASTER: YOU DID NOT ESTIMATE PUMPING FIGURES FOR THE 1940 TO '49 PERIOD, DID YOU?

THE WITNESS: 1940 THROUGH 1947, I DID NOT, 1948 AND 1949, I DID.

SPECIAL MASTER: ALL RIGHT. ONE OF THE CRITICISMS THAT COLORADO EXPERTS MADE IN USING THE 11,000 FIGURE FOR 1948 WAS THAT THAT WAS A WET YEAR, AND THEREFORE, YOU WOULD BE LOOKING AT SURFACE DIVERSIONS WHEN PUMPING WAS DOWN.

DO YOU AGREE WITH THAT?

THE WITNESS: COLORADO'S ESTIMATES OF PUMPING SHOWN IN 165* INDICATE, BASED ON THEIR ESTIMATES, THAT THEY BELIEVE THAT THERE WAS PUMPING HIGHER THAN THE 1948 LEVEL FOR YEARS PRIOR TO [1948]. THE U.S.G.S. IN JOINT EXHIBIT 66, THEIR ESTIMATES WERE THAT 1948 WAS THE HIGHEST LEVEL OF PUMPING THAT HAD BEEN ACHIEVED UP UNTIL THAT TIME.

• • • • •

SPECIAL MASTER: SO, MR. BOOK, YOU ARE SAYING THEN THAT THE U.S.G.S. CALCULATED 1948 AS THE HIGHEST AMOUNT OF PUMPING THAT HAD OCCURRED UP UNTIL THAT TIME, DURING THE '40'S.

THE WITNESS: THEY HAD AN ESTIMATE OF 15,000 ACRE FEET FOR 1946, '47, AND 1948.

SPECIAL MASTER: 15,000?

THE WITNESS: YES, FOR EACH OF THOSE YEARS.

BY MR. DRAPER:

• • • • •

SPECIAL MASTER: THAT IS FROM 1946 THROUGH '48?

THE WITNESS: THOSE ARE THE THREE YEARS THAT THEY HAVE THAT. THEIR TABULATION GOES BACK TO 1940.

SPECIAL MASTER: AND FROM YOUR CALCULATIONS, USING POWER RECORDS, YOU CONCLUDED THAT THAT WAS HIGH, THE 15,000?

THE WITNESS: FOR 1948?

SPECIAL MASTER: YES.

THE WITNESS: YES. THE REASON FOR THAT, WE ARE CONSISTENTLY BELOW THE U.S.G.S. VALUES FOR THE PERIOD 1948 THROUGH 1963. THEY USED A DIFFERENT METHOD OF CALCULATING OR REPORTING PUMPING IN BASIC DATA RELEASE 21 FOR THOSE YEARS. IT WAS NOT BASED ON THE FIELD INVESTIGATIONS OF THE WELLS. WE DON'T KNOW EXACTLY HOW IT WAS DETERMINED, BUT IT WAS BASED ON POWER RECORDS, GROSS POWER RECORDS FROM POWER COMPANIES.

AND IT APPEARS TO ME THAT THEY MAY HAVE SIMPLY TAKEN POWER DATA, TOTAL POWER DATA FROM THE COMPANIES AND APPLIED THE POWER COEFFICIENTS THAT THEY HAD DETERMINED IN THE FIELD IN THE 1960'S AND APPLIED IT TO ALL OF THE POWER WITHOUT ANY REDUCTION FOR THE AREA. BECAUSE WE MAKE THE REDUCTION FOR THE STUDY AREA, WE END UP WITH SLIGHTLY LOWER NUMBERS THAN THE U.S.G.S. FOR THE ENTIRE PERIOD OF 1948 THROUGH 1963.

I MIGHT POINT OUT THAT COLORADO, I GUESS WOULD TEND TO AGREE WITH THAT INTERPRETA-

TION BACK UNTIL ABOUT 1953. FROM 1953 THROUGH 1963, THE TWO STATES ARE VERY CLOSE IN THEIR ESTIMATES AND BOTH ARE BELOW THE U.S.G.S. TABULATION.

SPECIAL MASTER: ALL RIGHT.

• • • • •

Reply Appendix Item 18

Excerpt from R. vol. 129

September 25, 1992
(Cross-examination of Thomas Major)

[34]

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Q. NOW, YOU HAVE SAID THAT YOU AND THOSE IN YOUR OFFICE OF THE G.S. TOOK FIERCE PRIDE IN THE ACCURACY OF THE REPORTS THAT YOU ISSUED; IS THAT A FAIR STATEMENT?

A. YES, SIR.

Q. AND THESE REPORTS WERE CAREFULLY CHECKED AND PEER REVIEWED BEFORE THEY ARE RELEASED TO THE PUBLIC?

A. YES, SIR.

Q. WHAT LENGTH OF TIME ELAPSED FROM THE END OF THE STUDY PERIOD TO THE PUBLICATION OF THIS REPORT DURING WHICH YOU AND OTHERS CARRIED OUT THAT CHECKING?

A. APPROXIMATELY TWO YEARS.

Q. ARE YOU AWARE THAT THE STATE OF COLORADO IN THIS CASE IS ATTEMPTING TO DISCREDIT CERTAIN INFORMATION IN THIS REPORT?

A. NO, SIR.

• • • • •

[61-62]

Q. NOW, I WOULD LIKE TO CONFIRM MY STATEMENT THAT I THINK YOU HAVE MADE, AND THAT IS THAT YOU HAVE NO REASON TO DOUBT THE ACCURACY OF THE PUMPING FIGURES THAT ARE SHOWN IN BDR 21?

A. I DIDN'T DEVELOP THEM, AND I HAVE NO REASON TO BELIEVE THAT ANYONE WOULD DO ANYTHING THAT WOULDN'T BE ACCURATE.

Q. AND THOSE FIGURES WERE SUBJECT TO THE NORMAL PEER REVIEW AND CAREFUL CHECKING OF THE UNITED STATES GEOLOGICAL SURVEY?

A. YES, SIR.

Q. AND THAT WOULD INCLUDE IN PARTICULAR THE GROUND WATER WITHDRAWAL SHOWN IN FIGURE 3 OF THE REPORT?

A. WOULD YOU PLEASE REPHRASE IT, BECAUSE THERE ARE PORTIONS OF THIS THAT I CAN'T VERIFY AT ALL?

Q. THE QUESTION WAS WHETHER YOU HAD ANY REASON TO DOUBT, GIVEN THE PEER REVIEW AND CAREFUL CHECKING THAT YOU HAVE DESCRIBED, ANY REASON TO DOUBT THE ACCURACY OF THE GROUND WATER WITHDRAWAL FIGURES, THE PUMPING FIGURES SHOWN IN FIGURE 3.

A. KNOWING THE INTEGRITY OF TED HURR, I DON'T DOUBT IT AT ALL.

Q. WOULD YOU BE SURPRISED IF SOMEONE CLAIMED THAT THE FIGURES FOR 1940 WAS ACTUALLY 15 TIMES HIGHER THAN WHAT MR. HURR DETERMINED?

A. WITH THE BEST INFORMATION AVAILABLE, I'M SURE THAT'S WHAT HE THOUGHT WAS CORRECT.

• • • • •

Reply Appendix Item 19

Excerpt from R. vol. 131

October 27, 1992
(Cross-examination of Harold Simpson)

[22]

• • • • •

Q. WELL, THIS IS A DECREE OF THE WATER COURT, IS IT NOT?

A. YES, IT IS. BUT IT IS BASED ON INFORMATION PROVIDED BY THE APPLICANT.

Q. WELL, YOU ARE NOT SUGGESTING THAT PEOPLE FILED FALSE INFORMATION WITH THE WATER COURT, ARE YOU?

A. YES, I AM.

Q. WOULD THAT BE WHAT MR. ROBBINS HAS CALLED A FRAUD ON THE WATER COURT?

A. I DON'T KNOW WHAT HE CALLED IT. BUT I DO KNOW THAT IT HAPPENED. AND IT HAPPENED ESPECIALLY IN THIS TIME FRAME WHEN THERE WERE SO MANY APPLICATIONS FILED WITH THE COURT.

Q. NOW, YOUR OFFICE RELIES ON THE WATER RIGHTS DECREES, DOESN'T IT?

A. YES.

• • • • •

Reply Appendix Item 20

Excerpt from

Colorado's Closing Brief Re Kansas' Well Claim

• • • • •

D. KANSAS IS NOT ENTITLED TO RELIEF FOR WELL DEVELOPMENT WHICH TOOK PLACE PRIOR TO 1965

[44]

Colorado raised various affirmative defenses in its answer to the complaint; however, in cases between States, the Supreme Court has not paid attention to labels, *Washington v. Oregon*, 297 U.S. at 528, but has focused on the equities of the case. *Colorado v. Kansas*, 320 U.S. at 394. As Justice Cardozo said in *Washington v. Oregon*, it is "high equity that moves the conscience of the court in giving judgment between states." 297 U.S. at 523. Therefore, in addressing the reasons that Kansas' complaint about post-compact well development in Colorado which took place in the 1950s and early 1960s should be denied; Colorado will not try to pigeonhole Kansas' actions as laches, estoppel, etc. but will focus on those factors which courts of equity have traditionally considered in deciding whether to give judgment.

• • • • •

[48]

Given the fact Kansas failed to complain about post-compact well development in Colorado for many years, at least twenty years in the case of wells drilled in 1965, thirty five years in the case of wells drilled in 1950, Kansas should be barred from complaining about the effects of well development which occurred in Colorado prior to 1965. *Washington v. Oregon*, 297 U.S. at 528-29.

• • • • •

Reply Appendix Item 21

Excerpt from

Colorado's Memorandum Re Matters to Be Raised at Oral Argument

[2]

• • • • •

A. *LACHES*

Although the Special Master agrees that Kansas made no complaint about well pumping in Colorado until 1984 at the earliest, the Special Master may have felt constrained to reject the defense of laches because otherwise Kansas' delay would have barred relief against almost all of the wells in existence in 1985. Colorado suggests an alternate way to view Kansas' well claim and a method to apply laches which would produce a fairer result.

• • • • •

[4-5]

The Special Master may have felt constrained to reach this conclusion because otherwise Kansas' delay would have barred relief against 1,842 out of 2,062 large capacity irrigation wells drilled before 1965. Draft Report at 165. There is, however, another way to view Kansas' claim. . . . Rather than view Kansas' claim as one based on well construction *per se*, the claim can be viewed as one based on well *pumping* and treated in the nature of a continuing nuisance, in which each year's well pumping gives rise to a new cause of action. . . . Viewed in this light, Kansas' delay might bar relief against post-compact well pumping through the mid-1970s which occurred without complaint by Kansas, but not the increased well pumping which occurred in later years. . . . Viewing Kansas' claim in this light would also allow the Special Master to acknowledge the substantial prejudice that Kansas' delay has worked on Colorado in trying to quantify depletions to usable Stateline flows which allegedly occurred up through the mid-1970s.

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[52]

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VI. CONCLUSION

Colorado believes that the draft report should be modified as follows:

1. Laches should bar Kansas' well claim for pumping which occurred up to at least 1975, ten years before Kansas complained about post-compact well pumping in Colorado.

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Supreme Court, U.S.
FILED
JAN 3 1995
OFFICE OF THE CLERK

No. 105, Original

In the Supreme Court of the United States

OCTOBER TERM, 1994

STATE OF KANSAS, PLAINTIFF

v.

STATE OF COLORADO

ON EXCEPTIONS TO THE REPORT OF THE SPECIAL MASTER

BRIEF FOR THE UNITED STATES IN RESPONSE TO THE EXCEPTIONS OF KANSAS AND COLORADO

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QUESTION PRESENTED

The United States will address the following issues:

1. Whether Kansas may prove a violation of the Arkansas River Compact by demonstrating that Colorado violated the operating principles for Trinidad Reservoir (Kansas Exception No. 1).

2. Whether Kansas adequately proved that Colorado's administration of the Winter Water Storage Program resulted in a material depletion of usable flows at the Colorado-Kansas Stateline (Kansas Exception No. 2).

3. Whether the Special Master selected an appropriate method for calculating "usable" depletions (Kansas Exception No. 3).

4. Whether a heightened standard of proof and equitable principles, such as the doctrine of laches, are applicable in a Compact enforcement action (Colorado Exception Nos. 1 and 4).

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In the Supreme Court of the United States

OCTOBER TERM, 1994

No. 105, Original

STATE OF KANSAS, PLAINTIFF

v.

STATE OF COLORADO

ON EXCEPTIONS TO THE REPORT OF THE SPECIAL MASTER

BRIEF FOR THE UNITED STATES IN RESPONSE TO THE EXCEPTIONS OF KANSAS AND COLORADO

STATEMENT

In 1985, the State of Kansas brought this original action against the State of Colorado to resolve disputes under the Arkansas River Compact, Act of May 31, 1949, ch. 155, 63 Stat. 145. This Court granted Kansas leave to file its complaint, *Kansas* v. *Colorado*, 475 U.S. 1079 (1986), and the Court appointed the Honorable Wade H. McCree, Jr., to serve as the Special Master. 478 U.S. 1018 (1986). Upon Judge McCree's death, the Court appointed Arthur L. Littleworth as the Special Master. 484 U.S. 910 (1987). Special Master Littleworth supervised pretrial proceedings, granting the United States' unopposed motion to intervene, and allowing certain amendments to the pleadings. He entered preliminary

rulings, held a liability trial on Kansas's claims, and prepared a report. On October 3, 1994, this Court received the Special Master's report on the liability phase of the case and invited the parties to file exceptions. 115 S. Ct. 48 (1994).[1]

1. The Arkansas River Basin

The Arkansas River originates on the eastern slope of the Rocky Mountains in central Colorado and flows south and then east across Colorado and into Kansas. It receives significant in-flows from the Purgatoire River, its major tributary in Colorado, which originates in the Sangre de Cristo mountains in southern Colorado near the New Mexico border. The Purgatoire River flows in a northeasterly direction to join the Arkansas River about 60 miles west of the Kansas border at Las Animas, Colorado. See 1 Rep. 35-40, 50-57. See Pocket Map (contained in 1 Rep.).

The United States has constructed three relevant water storage projects on this river system. The John Martin Reservoir, located immediately east of the juncture of the Purgatoire and Arkansas Rivers in Colorado, is operated by the Army Corps of Engineers to control floods and to provide storage water in accordance with the Arkansas River Compact. It has a storage capacity of approximately 618,000 acre-feet. 1 Rep. 45-48. The Pueblo Reservoir, located on the Arkansas River about 150 miles upstream of the Kansas border near Pueblo, Colorado, is managed by the Department of the Interior's Bureau of Reclamation as part of the Fryingpan-Arkansas Project. It has a storage capacity of approximately 358,000 acre-feet. 1 Rep. 43-44. The

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[1] The Special Master's report consists of three volumes (cited as _ Rep. ___) and a bound appendix (cited as Rep. App. __).

Trinidad Reservoir, located on the Purgatoire River near Trinidad, Colorado, is jointly managed by the Army Corps of Engineers and the Bureau of Reclamation to control floods and to provide storage water for use by the Bureau of Reclamation's Trinidad Project. It has a storage capacity of approximately 114,000 acre-feet. 1 Rep. 43.

Twenty-three canal systems in Colorado divert water from the Arkansas River for irrigation. Fourteen of those systems are located upstream from John Martin Reservoir, and four of those systems have associated privately owned, off-channel, water storage facilities. Those facilities include Lake Henry and Lake Meredith, the Holbrook, Dye, Adobe Creek and Horse Creek Reservoirs, and the Great Plains Reservoir System. They were constructed before Colorado entered into the Arkansas River Compact and collectively have a storage capacity of about 800,000 acre-feet. Six canal systems in Kansas operate between the Colorado border and Garden City. A small associated reservoir, Lake McKinney, has a storage capacity of about 3600 acre-feet. See 1 Rep. 41-43.

2. The Arkansas River Compact

The Arkansas River Compact apportions the Arkansas River between the States of Kansas and Colorado. As the Special Master explains, the Compact was an outgrowth of two original actions that the States had filed in this Court disputing their respective entitlements to use of the Arkansas River. 1 Rep. 1-6. In each of those cases, the Court denied Kansas's request for an equitable apportionment. See *Colorado* v. *Kansas*, 320 U.S. 383, 391-392 (1943); *Kansas* v. *Colorado*, 206 U.S. 46, 114-117 (1907).

In the first suit, Kansas sought to enjoin water diversions in Colorado, but the Court denied relief on the ground that Colorado's depletions of the Arkansas River were insufficient at that time to warrant injunctive relief. *Kansas* v. *Colorado*, 206 U.S. at 114-117. In the second suit, Colorado sought to enjoin lower court litigation brought by Kansas water users against Colorado water users, while Kansas sought an equitable apportionment of the Arkansas River. The Court concluded that Colorado was entitled to the injunction it sought, but the Court concluded once again that Kansas had failed to show sufficient injury to warrant an equitable apportionment of the Arkansas River. *Colorado* v. *Kansas*, 320 U.S. at 391-392. See 1 Rep. 2-6.

In denying Kansas's second request for judicial relief, the Court suggested that a dispute such as this one calls for "expert administration rather than judicial imposition of a hard and fast rule," and that the controversy "may appropriately be composed by negotiation and agreement, pursuant to the compact clause of the federal Constitution." *Colorado* v. *Kansas*, 320 U.S. at 392. Shortly thereafter, the States appointed commissioners to negotiate an interstate agreement. In 1949, the States approved, and Congress ratified, the Arkansas River Compact, 63 Stat. 145. See generally 1 Rep. 5-6, 71-90, 91-108; Rep. App. 1-17 (reprinting text of Compact).

The Compact was intended to "[s]ettle existing disputes and remove causes of future controversy" between the States and their citizens over the use of the Arkansas River, and to

> [e]quitably divide and apportion between the States of Colorado and Kansas the waters of the Arkansas River and their utilization as well as the benefits arising from the construction, operation and

> maintenance by the United States of John Martin Reservoir Project for water conservation purposes.

Compact Art. I (Rep. App. 1-2). The Compact accomplishes those goals through two basic mechanisms.

First, the Compact protects the States' respective rights to continued use of the Arkansas River through a limitation on new depletions. Article IV-D of the Compact allows new development in the form of dams, reservoirs, and other water-utilization works in Colorado and Kansas, provided that the "waters of the Arkansas River" are not thereby "materially depleted in usable quantity or availability for use to the water users in Colorado and Kansas under this Compact." Rep. App. 5. The Compact defines the term "waters of the Arkansas River," Art. III-B (Rep. App. 2-3), but it does not expressly define what constitutes a "material" depletion or a "usable" quantity.[2]

Second, the Compact regulates the storage of water at John Martin Reservoir and specifies the criteria by which each State is entitled to call for water releases. Article V of the Compact, which provides the "basis of

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[2] The full text of Article IV-D states as follows:

> D. This Compact is not intended to impede or prevent future beneficial development of the Arkansas River basin in Colorado and Kansas by Federal or State agencies, by private enterprise, or by combinations thereof, which may involve construction of dams, reservoir, and other works for the purposes of water utilization and control, as well as the improved or prolonged functioning of existing works: Provided, that the waters of the Arkansas River, as defined in Article III, shall not be materially depleted in usable quantity or availability for use to the water users in Colorado and Kansas under the Compact by such future development or construction. Rep. App. 5.

apportionment of the waters of the Arkansas River," prescribes the timing of storage at the reservoir and the release criteria. See Rep. App. 5-9. Basically, between November 1 and March 31, in-flows to the John Martin Reservoir are stored, subject to Colorado's right to demand a limited amount of water. Between April 1 and October 31, the storage of water is largely curtailed, and either State may call for releases at any time in accordance with the flow rates set out in the Compact.[3]

The Compact creates an interstate agency, the Arkansas River Compact Administration, to administer the Compact. Compact Art. VIII (Rep. App. 11-15). The Compact Administration consists of a non-voting

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[3] During the April-to-October irrigation season, Colorado may generally demand releases of water equivalent to a flow of 500 cubic feet per second (cfs) and Kansas may request releases equivalent to a flow of between 500 cfs and 750 cfs. See Rep. App. 5-9; 1 Rep. 45-48. The Compact regulates only the release rates, and historically, each State attempted to maximize its volumetric share by requesting release at the maximum flow rate until all of the storage water was depleted, which typically occurred early in the irrigation season. See 1 Rep. 45-48. In 1980, the Compact's administrative body, the Arkansas River Compact Administration (see text *infra*), adopted a resolution, known as the 1980 Operating Plan (reprinted at Rep. App. 107-117) to provide for more efficient utilization of the storage water. See 1 Rep. 47-48; 2 Rep. 171-180. In essence, the Operating Plan established separate storage accounts for each State and allocated 40 percent of stored water to Kansas and 60 percent to various Colorado canals. In addition, the Plan allowed three Colorado canal companies to store water in John Martin Reservoir that they otherwise would store elsewhere. In exchange for that right, those Colorado canals allowed 35 percent of their stored water to be credited to a Kansas Transit Loss Account. By its terms, the 1980 Operating Plan can be terminated by either State. See 1 Rep. 47-48; Rep. App. 111, 114-117.

presiding officer designated by the President of the United States and three voting representatives from each State. It is empowered to adopt by-laws, rules, and regulations, prescribe procedures for the administration of the Compact, and perform functions to implement the Compact. See Arts. VIII-B and VIII-C (Rep. App. 11-12). Article VIII-H of the Compact directs that the Administration shall "promptly investigate[]" violations of the Compact and report its findings and recommendations to the appropriate state official. Rep. App. 15. That Article further states that it is "the intent of this Compact that enforcement of its terms shall be accomplished in general through the State agencies and officials charged with the administration of water rights." Rep. App. 15.

3. The Current Proceedings

Kansas brought this action in 1985 to enforce the provisions of the Arkansas River Compact. In the course of pretrial proceedings, the Special Master narrowed the dispute to three alleged violations of the Compact arising from: (a) groundwater pumping in Colorado; (b) the Winter Water Storage Program (WWSP) at Pueblo Reservoir; and (c) the operation of Trinidad Reservoir. 1 Rep. 58. See also 1 Rep. 15-34 (describing procedural history of the case).[4]

a. Kansas's First Amended Complaint alleged that Colorado had violated the Arkansas River Compact by failing to allow the Compact Administration to investigate the impact of groundwater pumping on

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[4] In response to Kansas's complaint, Colorado filed counterclaims challenging well pumping in Kansas and storage of releases from John Martin Reservoir into Lake McKinney. The Special Master has recommended dismissal of Colorado's counterclaims, and Colorado has not excepted to that recommendation. See 1 Rep. 58; 3 Rep. 436-459; Colo. Excepts. 1-2.

Arkansas River flow at the Colorado-Kansas Stateline. First Amended Compl. para. 12 (Rep. App. 23-24). At trial, Kansas altered its theory and produced evidence that post-Compact increases in groundwater pumping in Colorado had caused a substantial decline in the Arkansas River's surface flow. The Special Master evaluated that evidence and concluded that post-Compact groundwater pumping in Colorado had "materially depleted" the "usable" flow at the Stateline, in violation of Compact Article IV-D (Rep. App. 5). See 2 Rep. 263. He rejected Colorado's defenses that Kansas's claim should be barred under the equitable doctrines of laches, estoppel, waiver, and unclean hands. See 1 Rep. 169-170. The Special Master recommended that, if the Court agreed with his liability determination, the Court should remand the case to him for a determination of the appropriate remedy. 2 Rep. 263.

b. The WWSP was conceived by the Bureau of Reclamation and Colorado to obtain additional benefits from the Bureau's Fryingpan-Arkansas Project. That Project, which Congress authorized in 1962, Pub. L. No. 87-590, 76 Stat. 389, consists of a system of reservoirs and other facilities that transport water from the Colorado River Basin, west of the Continental Divide, to the more populated areas in the Arkansas River Basin, east of the Continental Divide. The Project's facilities, which were substantially completed in 1975, include a storage reservoir and water collection system on the west side of the Continental Divide, a tunnel for transporting water across the Divide, and three water storage facilities on the east side of the Continental Divide. Pueblo Reservoir is the largest of the eastern water storage facilities. The "imported" water stored there provides irrigation flows for lands served by the

Fryingpan-Arkansas Project, including lands within the Southeastern Colorado Conservancy District. That water is also utilized for power generation and for municipal and industrial uses. See 1 Rep. 43-44; 2 Rep. 306-307.

In 1964, the Bureau of Reclamation and Colorado began planning a program to utilize excess capacity at Pueblo Reservoir to store a portion of the winter-time flow of the Arkansas River. Prior to Pueblo Reservoir's construction, that winter-time flow was used by Colorado irrigators either to inundate uncultivated cropland (a process known as "winter irrigation") or for storage in privately owned, off-channel reservoirs. Under the WWSP, which commenced in 1976, most of the winter flow that was previously used for "winter irrigation" is stored in Pueblo and John Martin Reservoirs, as well as private reservoirs, for distribution to irrigators during the irrigation season. 2 Rep. 307-311.

Kansas initially challenged the WWSP as a "unilateral rejection of the Arkansas River Compact Administration's Resolution of July 24, 1951, requiring that any reregulation of the native water of the Arkansas River be approved by the Compact Administration." First Amended Compl. para. 12 (Rep. App. 24). See 2 Rep. 306. The Special Master partially resolved that claim against Kansas by recommending that the Court grant Colorado's motion for summary judgment that the Compact does not require Administration approval of the WWSP. See 2 Rep. 306. The Special Master reserved for trial "the issue of whether Stateline flows had actually been materially depleted by the WWSP in violation of the compact." 2 Rep. 306. Based on the evidence adduced at trial, the Special Master concluded that "Kansas has not proved that the WWSP has caused material Stateline

depletions." 2 Rep. 335. The Special Master determined that "the depletions shown by the Kansas model are well within the model's range of error" and that "[o]ne cannot be sure whether impact or error is being shown." 2 Rep. 334-335. The Special Master observed that "Kansas' case has not been helped by its own contradictions in quantifying impacts to usable flow." 2 Rep. 335.

c. Trinidad Reservoir was constructed by the Army Corps of Engineers in 1977, but it is jointly managed by the Corps for flood control and by the Bureau of Reclamation for irrigation and for conservation storage of winter flow. 1 Rep. 43; 3 Rep. 382-390. Before Trinidad Reservoir was constructed, the Bureau of Reclamation had prepared operating principles that, among other things, restricted conservation storage in the Reservoir to a maximum of 20,000 acre-feet. See 3 Rep. 388-390. The operating principles were approved by the Corps of Engineers and the Colorado Water Conservation Board, and were included in the February 1967 repayment contract between the Bureau and the local Purgatoire Water Conservancy District. 3 Rep. 390-391, 414. The Bureau also submitted the operating principles to the State of Kansas, which approved them, subject to certain amendments, and to the Compact Administration, which adopted a motion approving them in their amended form. 3 Rep. 390-395.

From 1979 to 1984, Colorado's Division 2 Water Engineer allowed the Purgatoire River Water Conservancy District, which had effective control over the Trinidad Reservoir's conservation pool, to make certain "accounting transfers" that, Kansas alleged, violated the operating principles. 3 Rep. 396. In 1988, at the request of the Compact Administration, the Bureau of Reclamation conducted a study of operations at Trinidad

Reservoir and concluded that two storage accounting practices at the Reservoir constituted a "departure from the intent of the operating principles." 3 Rep. 397.[5] Thereafter, in 1989, the Colorado Engineer directed that those practices be curtailed. 3 Rep. 405. The Special Master concluded that "[i]t appears that this directive is currently being followed, although a state action has been filed to amend relevant water rights decrees." 3 Rep. 406.

As the Special Master explained, Kansas's current theory respecting the Trinidad Project "is not apparent from the face of the complaint." 3 Rep. 407. Kansas asserted in its 1989 Amended Complaint (Rep. App. 23-24) that Colorado had violated the Compact by rejecting Kansas's requests for a Compact investigation into Colorado's accounting practices. 3 Rep. 407. At other times in the litigation, however, Kansas seemed to suggest that the Trinidad Project had caused a material depletion in Stateline flows, in violation of Article IV-D of the Arkansas River Compact (Rep. App. 5). See 3 Rep. 407-408. By the time of trial, Kansas "presented quite a different legal concept." 3 Rep. 408. Kansas argued that a "departure from the Operating Principles is a violation of the Compact, regardless of injury." 3 Rep. 408.

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[5] The Bureau found that the Colorado accounting practices at issue were "contrary to the assumptions" of the operating principles because they allowed the Trinidad Reservoir to store irrigation water in excess of 20,000 acre-feet. The Bureau specifically identified the Colorado Engineer's practices of: (1) allowing storage of winter flows without counting them against the 20,000 acre-feet storage limit; and (2) allowing water remaining in the conservation account at year's end to be transferred to another account so that a full 20,000 acre-feet could be stored in the following year. 3 Rep. 396-397, 399-406.

Kansas sought to prove a violation of the Compact under that theory by relying on evidence "comparing the flows into John Martin Reservoir 'as they would have occurred under the Operating Principles with the flows that occurred under actual operations.'" 3 Rep. 409.[6]

The Special Master received that evidence, but concluded that Kansas's Trinidad Reservoir claim should be dismissed. He explained that Article IV-D of the Compact (Rep. App. 5) allows construction of new reservoirs in Colorado "provided the flows of the Arkansas River are not materially depleted in usable quantity or availability for use in Kansas." 3 Rep. 424. The Special Master therefore determined that Article IV-D furnishes the Compact mechanism for challenging Trinidad Reservoir operations. He stated that while the Trinidad Reservoir operating principles were intended to prevent a "material depletion," a failure to adhere to the principles does not in itself "establish a Compact violation." 3 Rep. 426. Instead, a Compact claim must be based on "the actual operation of the Project" and "whether such operation has caused a material depletion." 3 Rep. 426. The Special Master concluded that Kansas had failed to show that the Trinidad Project had caused "a material depletion within the meaning of Article IV-D." 3 Rep. 431.

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[6] Kansas's theory may have reflected the State's own doubts whether it could prove that the Trinidad Reservoir operations "materially depleted" Stateline flows in violation of Article IV-D. The Bureau's study (see note, 5, *supra*) suggested that even when the Trinidad Reservoir was operated in violation of the operating principles, it produced greater in-flow to John Martin Reservoir than if the Trinidad Project had not been in place. 3 Rep. 399-401; see also 3 Rep. 426-428.

In reaching that conclusion, the Special Master rejected Kansas's argument that the Compact Administration's adoption of a motion approving the operating principles was a "proper exercise of authority under Article VIII-B of the Compact" that was "binding upon Colorado." 3 Rep. 412. Article VIII-B empowers the Compact Administration to adopt "rules and regulations," prescribe "procedures for the administration of [the] Compact," and perform other "proper functions." Rep. App. 11. The Special Master examined the record and concluded that the Compact Administration "did not do, nor intend to do, what Kansas now claims." 3 Rep. 414. In particular, he found "nothing to indicate that the Compact representatives of either State thought they were exercising binding authority under Article VIII-B." 3 Rep. 415.

INTRODUCTION AND SUMMARY OF ARGUMENT

The State of Kansas brought this action to enforce its rights under the Arkansas River Compact, which apportions the flow of the Arkansas River between Kansas and Colorado. The Special Master has prepared a thorough report providing his recommendations on Kansas's three central claims and Colorado's two counterclaims. 2 Rep. 336-337. Kansas and Colorado have each filed exceptions to the Special Master's recommendations. Kansas objects to the Special Master's recommendations that this Court: (1) dismiss the Trinidad Reservoir claim; (2) reject, as unproved, the Winter Water Storage Program claim; and (3) reject Kansas's preferred method for determining usable depletions. Kan. Excepts. 1-3. Colorado objects to the Special Master's recommendations that this Court: (1) reject Colorado's laches defenses, which are based on the asserted delay by Kansas in presenting its groundwater

pumping claim; (2) set Colorado's pre-Compact groundwater pumping level at 15,000 acre-feet per year; (3) decline to treat the increases in Stateline flow produced by post-1980 alterations in John Martin Reservoir operations as offsets to the well-pumping depletions; and (4) apply the "preponderance of the evidence" standard to Kansas's proof of Compact violations. Colo. Excepts. 1-4.

With respect to the exceptions filed by Kansas, the United States is in substantial agreement with the Special Master's recommendations. The first exception, which challenges the Special Master's recommendation that this Court dismiss the Trinidad Reservoir claim, is unsound as a matter of law. The Special Master correctly concluded that Kansas had failed to establish that Colorado's accounting practices at Trinidad Reservoir had violated Article IV-D of the Compact, which prohibits new developments on the river system that cause a material depletion of the Stateline flows. He properly rejected Kansas's contention that a violation of the Trinidad Reservoir's operating principles is, in itself, a per se violation of the Compact. Although the Special Master recommends against allowing Kansas to enforce the operating principles through this action, which Kansas brought expressly to enforce the Compact, he has left open the possibility of other remedies if Colorado departs from those principles in the future.

Kansas's second exception, which asks the Court to reject the Special Master's determination that Kansas failed to prove its Winter Water Storage Program claim, is unpersuasive in light of the Special Master's extensive discussion of his reasons for his conclusion. Kansas is wrong in contending that the Special Master erred in placing the risk of uncertainty resulting from lack of data on Kansas. Kansas, as the plaintiff, has the burden

of proving its claims. The Special Master properly found, based upon a thorough examination of the evidence, that Kansas had failed to prove that Colorado's conduct had caused the injury that Kansas alleged. Kansas's contention that the Special Master based his decision on an incomplete record of accretions rests on a misreading of the Special Master's decision.

Kansas's third exception, which asks the Court to reject the Special Master's method for calculating "usable depletions," is without merit. At trial, Kansas presented three different methods for performing that calculation. The Special Master thoroughly reviewed each of those methods and properly concluded that Kansas's "Durbin approach, using Larson's coefficients, is the best of the several methods presented for determining usable flows." 2 Rep. 305 Kansas's objection to the Special Master's reliance on that method overlooks the defects in the "daily flow" method that Kansas favors.

With respect to the exceptions filed by Colorado, the United States did not participate in the proceedings concerning groundwater development in Colorado and does not take a position on the specific merits of Colorado's exceptions. We are in general agreement with Colorado's legal position that the Court's rationale for applying a heightened standard of proof in equitable apportionment actions, *Colorado* v. *New Mexico*, 467 U.S. 310 (1984), would appear to apply in this Compact enforcement action. On the facts of this case, however, the Special Master concluded that Kansas had proved that Colorado's groundwater pumping violated the Compact regardless of the standard of proof applied. We also agree with Colorado that, as a general matter, this Court may recognize laches as an equitable defense in a

Compact enforcement action. It does not necessarily follow, however, that Colorado has established that defense here.

ARGUMENT

A. THE SPECIAL MASTER CORRECTLY CONCLUDED THAT KANSAS FAILED TO ESTABLISH THAT COLORADO'S DEPARTURES FROM THE TRINIDAD RESERVOIR OPERATING PRINCIPLES CONSTITUTE A VIOLATION OF THE ARKANSAS RIVER COMPACT

Kansas challenges the Special Master's recommendation that this Court dismiss the Trinidad Reservoir claim and specifically contests his determination that Kansas failed to prove a violation of the Arkansas River Compact. Kan. Br. 12-26. According to Kansas, the Trinidad Reservoir operating principles were "promulgated as an official action of the Compact Administration in furtherance of its mandate to implement the Arkansas River Compact," and proof that Colorado failed to comply with the operating principles established that Colorado "violated the Arkansas River Compact." Kan. Br. 6-7, 14. See 3 Rep. 408. The Special Master correctly rejected that contention. 3 Rep. 412-433.

As the Special Master recognized, this Court granted Kansas leave to file a complaint based on allegations that Colorado had committed a "breach of the Arkansas River Compact." First Amended Compl. para. 16 (Rep. App. 25). He therefore evaluated Kansas's claims in light of the rights conferred by that interstate agreement. As the Special Master explained, Article IV-D of the Arkansas River Compact specifically states that "[t]his Compact is not intended to impede or prevent future development of the Arkansas River basin" through construction of

new reservoirs, such as Trinidad Reservoir. The only limitation is contained in the proviso to Article IV-D that "the waters of the Arkansas River" may not thereby be "materially depleted in usable quantity or availability for use to the water users in Colorado and Kansas under this Compact" (Rep. App. 5). See 3 Rep. 424. The Special Master accordingly concluded that to establish a Compact violation, Kansas had to show that the Trinidad Reservoir operations caused a "material depletion" of usable flow at the Stateline compared to what the Stateline flows would have been without the Trinidad Project. 3 Rep. 424-425. That conclusion rests on a straightforward interpretation of the plain language of Article IV-D. See Rep. App. 5.

Kansas nevertheless suggests that the Arkansas River Compact can also be effectively "violated" through conduct that is inconsistent with the Compact Administration's actions. Kan. Br. 6-7, 14. Specifically, Kansas notes that prior to completion of the Trinidad Project, the Compact Administration approved a document containing the Trinidad Reservoir operating principles. Kan. Br. 12-15; Kan. Br. App. A51. See 3 Rep. 412-424. Kansas contends that the Compact Administration's approval of the operating principles "set procedures for operation of Trinidad Reservoir necessary to comply with the Compact" and that a violation of the operating principles should therefore be treated as a violation of the Compact itself. See Kan. Br. 15; 3 Rep. 408.

Kansas can point to nothing in the Compact, however, that provides Kansas with a right to challenge upstream reservoir operations in the absence of a "material" depletion. See 3 Rep. 424-426. Kansas cannot overcome that omission by relying on the Compact Administration's approval of the Trinidad Reservoir operating

principles. The Compact does not empower the Compact Administration to amend the Compact to create a new enforceable right or a new cause of action under the Compact; nor, to our knowledge, has the Compact Administration asserted such a power. See 3 Rep. 416. Indeed, Kansas concedes that point. See Kan. Br. 25 ("An interstate compact adopted under [the Compact Clause] cannot be changed by the interstate agency created by the compact.").

To be sure, the Compact authorizes the Compact Administration to promulgate "rules and regulations consistent with the provisions of this Compact." Compact Art. VIII-B(1) (Rep. App. 11). That Article, however, does not authorize the Compact Administration to accomplish what Kansas attributes to it in approving the operating principles. Article IV-D states that "[t]his Compact"—which includes Article VIII-B, on which Kansas relies—"is not intended to impede or prevent future development" (such as the Trinidad Project) unless the usable Stateline flow is "materially depleted" as a result. Furthermore, Article VIII-B itself allows the Compact Administration to adopt only such rules and regulations as are "consistent with this Compact"; it therefore does not authorize the Administration to adopt rules that impose enforceable standards for establishing a violation of the Compact that differ from the one ("material depletion") set forth in Article IV-D of the Compact itself. But even if the Court construed the Kansas complaint to allege a violation of a Compact rule, and additionally concluded that a State may seek judicial enforcement of such rules, Kansas's claim would still founder. The operating principles at issue here "clearly were not rules of the Compact Administration in any normal sense." 3 Rep. 414. The

Special Master "carefully examined the record presented here of the Compact Administration's consideration of the Trinidad Project," and he found "nothing to indicate that the Compact representatives of either State thought they were exercising binding authority under Article VIII-B." 3 Rep. 415. See 3 Rep. 417-418 & n.8.[7]

Kansas also attempts to overcome that problem through reliance on this Court's decision in *Texas* v. *New Mexico*, 462 U.S. 554 (1983). Kan. Br. 15-19. That case presented a dispute under the Pecos River Compact, Act of June 9, 1949, ch. 184, 63 Stat. 159, which is administered by the Pecos River Commission. New Mexico contended, among other things,

> that this Court may do nothing more than review official actions of the Pecos River Commission, on the deferential model of judicial review of administrative action by a federal agency, and that this case should be dismissed if we find either that there is no Commission action to review or that the actions the Commission has taken were not arbitrary or capricious.

462 U.S. at 566-567. The Court rejected New Mexico's contention, explaining that the Court's original

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[7] Kansas takes issue with the Special Master's conclusion on that point. Kan. Br. 20-22. As the Special Master explained, however, the Compact Administration's approval of the operating principles did not follow the notice and publication requirements established in the Administration's by-laws for adopting rules and regulations. 3 Rep. 413. The fact that the operating principles are expressed in "mandatory" language (Kan. Br. 20, 22) does not transform them into rules formally adopted by the Commission, much less ones that are enforceable in the same manner as the Compact itself. Cf. *United States* v. *Montalvo-Murillo*, 495 U.S. 711, 717-719 (1990).

jurisdiction "extends to a suit by one State to enforce its compact with another State or to declare rights under a compact," *id.* at 567, and that "the mere existence of a compact does not foreclose the possibility that [the Court] will be required to resolve a dispute between the compacting States," *id.* at 568. The Court additionally noted that New Mexico's theory was "untenable" because it "is not the proper function of our original jurisdiction" to conduct "judicial review" of the Pecos River Commission's actions. *Id.* at 570. The Court stated:

> If authorized representatives of the compacting States have reached an agreement within the scope of their congressionally ratified powers, recourse to this Court when one State has second thoughts is hardly "necessary for the State's protection."

Id. at 570-571.

Kansas contends that the *Texas* v. *New Mexico* decision requires this Court to enforce the Trinidad operating principles against Colorado, because the Arkansas River Compact Administration approved those principles and Colorado has no need for "recourse to this Court." Kan. Br. 19. That reasoning is unsound. The issue in *Texas* v. *New Mexico* was whether the Court should engage in judicial review of Compact Commission actions. That issue is not present here. No one has asked this Court to review a Compact Administration decision. The issue instead is whether Kansas may prove a "breach of the Arkansas River Compact" (Rep. App. 25) based on conduct that the Compact itself does

not forbid. The Special Master correctly concluded that Kansas may not do so. 3 Rep. 426.[8]

B. THE SPECIAL MASTER CORRECTLY CONCLUDED THAT KANSAS FAILED TO PROVE THAT THE WINTER WATER STORAGE PROGRAM VIOLATES THE COMPACT

Kansas contends that the Special Master erred in finding that Kansas failed to prove its claim under Article IV-D of the Compact that the WWSP had "materially depleted" Stateline flows. Kan. Br. 26-34. Kansas contends that the Special Master improperly placed the burden of proof on Kansas, erred in his

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[8] The Special Master was careful to indicate that he was rejecting Kansas's Trinidad claim based on the State's theory at trial that Colorado's violation of the reservoir operating principles "*per se* constituted a Compact violation." 3 Rep. 408. He expressly reserved the question that Kansas has not raised in this proceeding—namely, "whether Kansas has a claim for violation of the Operating Principles that is independent of the Compact." 3 Rep. 408 n.6. As the Special Master noted, Colorado has discontinued the practices that precipitated Kansas's claims. 3 Rep. 406 & n.5. If new violations of the operating principles should occur, Kansas would not be foreclosed by the Special Master's recommendation from seeking equitable relief under some other theory in an appropriate forum. Kansas conceivably might even seek to invoke this Court's original jurisdiction to address the issue, *Texas* v. *New Mexico*, 462 U.S. at 567-568, although that course might give rise to questions regarding satisfaction of the usual prerequisites for an original action (*e.g.*, a show of substantial injury) and whether an original action could appropriately be based on criteria other than the Compact's "material depletion" standard. But whatever the answer to those questions, Kansas cannot seek to enforce the operating principles on the theory that it is enforcing the Compact. Cf. *Nebraska* v. *Wyoming*, 113 S. Ct. 1689, 1694-1695 (1993) (distinguishing suits for "enforcement" of a decree from suits seeking recognition of "new rights").

analysis with respect to the "uncertain" nature of the Kansas claims and the effect of accretions on depletions, and failed to give Kansas a full opportunity to prove its case. Kan. Br. 28-34. Those claims are without merit. 2 Rep. 335.[9]

The Special Master properly recognized at the outset of his report that "Kansas, as plaintiff, must prove its case." 1 Rep. 65. Kansas attempted to meet its burden by constructing a hydrologic model of the river system in Colorado and comparing the results of two model simulations, one designed to simulate Stateline flows with no WWSP, the other designed to simulate flows with the WWSP in effect. 2 Rep. 326.[10] See generally 2 Rep. 228-263 (describing the Kansas model). The Special Master reviewed the many errors uncovered in the model simulations, the many changes that Kansas itself made to the quantification of its claim, and the many criticisms of the model's accuracy. 2 Rep. 314-335. Based upon that record, the Master concluded that Kansas had not proved its WWSP claim. 2 Rep. 335.

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[9] Although the Federal Rules of Civil Procedure may be "taken as a guide to procedure in an original action in this Court," Sup. Ct. R. 17.2, and they provide that a Master's factual findings in a non-jury action should be accepted unless clearly erroneous, Fed. R. Civ. P. 53(e)(2), this Court has explicitly departed from that practice and instead conducts an "independent review of the record." *Colorado* v. *New Mexico*, 467 U.S. 310, 317 (1984). The Court has stated that "[t]hough the Master's findings * * * deserve respect and a tacit presumption of correctness, the ultimate responsibility for deciding what are correct findings of fact remains with [the Court]." *Id.* at 317. See also *Mississippi* v. *Arkansas*, 415 U.S. 289, 291-292, 294 (1974).

[10] As the Special Master noted, Kansas modeled "two hypothetical situations without a common base. Kansas did not model the real WWSP, as it has been operating." 2 Rep. 325.

In the face of that failure, Kansas argues that the Special Master should not have placed on it the burden of proof. Kan. Br. 28-32. There is, however, nothing unusual or unfair in placing the burden of proof on Kansas in this case. See 1 Rep. 65-70. Prior to the ratification of the Arkansas River Compact, Kansas clearly had the burden of proving injuries from upstream developments. See *Colorado* v. *Kansas*, 320 U.S. 383, 391-392 (1943); *Kansas* v. *Colorado*, 206 U.S. 46, 114-117 (1907); see also *Colorado* v. *New Mexico*, 459 U.S. 176, 187 n.13 (1982) ("Our cases establish that a State seeking to prevent or enjoin a diversion by another State bears the burden of proving that the diversion will cause it 'real or substantial injury or damage.'"). The Compact adopted a specific standard for establishing injury, and Kansas is now entitled to obtain relief under the Compact upon a showing that usable Stateline flows are "materially depleted." Art. IV-D (Rep. App. 5). The Compact, however, did not address the burden of proof, and it is therefore reasonable to continue to place that burden on Kansas. Cf. *Green* v. *Bock Laundry Mach. Co.*, 490 U.S. 504, 521 (1989) ("A party contending that legislative action changed settled law has the burden of showing that the legislature intended such a change.").[11]

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[11] It may be that the Compact's "material depletion" standard imposes a difficult evidentiary burden on the downstream State. See Kan. Br. 28-30. Nevertheless, Kansas agreed to that standard, and this Court should be reluctant to interfere with the agreement that was struck. Contrary to Kansas's suggestion (Kan. Br. 30), it would be counter-productive to the encouragement of interstate compacts if Kansas could now insist that the practical burdens of proving a violation under the negotiated standard warrant a shifting of the burden of proof. See *Texas* v. *New Mexico*, 462 U.S. at 567-568 ("If there is a compact, * * * our first and last order of business is interpreting the compact.").

Contrary to Kansas's assertions, the Special Master did not reject Kansas's claim simply because is was "uncertain" (Kan. Br. 26, 28, 32); rather, he rejected the claim because it was so "uncertain" as to be unproved. The Special Master conducted a thorough analysis of Kansas's evidence of its WWSP claim and concluded that "Kansas has not proved that the WWSP has caused material Stateline depletions." 2 Rep. 335. Indeed, he found numerous problems with Kansas's evidentiary presentation. For example, he noted that there were significant errors in comparing Kansas's model results with actual Stateline flows.[12] The Special Master was also troubled by the facts that the Kansas model did not take into account "winter storage in John Martin Reservoir," 2 Rep. 326, that it "overpredicts" stored water by 141,500 acre-feet, 2 Rep. 327, and that it did not accurately account for evaporative losses resulting from winter irrigation, 2 Rep. 329-335. The Special Master also observed that "Kansas' case has not been helped by its own contradictions in quantifying impacts to usable flows." 2 Rep. 335. The fact that Kansas provided the

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[12] The Special Master pointed out that the State's modeling results for six of the ten years it analyzed either over-predicted or under-predicted observed Stateline flows by more than 30 percent. In the three years in which the error was less than 10 percent, the average error still amounted to 12,251 acre-feet per year. 2 Rep. 322-324. The Special Master contrasted those large errors to the much smaller WWSP depletions calculated by Kansas's model, which amounted to either 4739 acre-feet per year, or 1538 acre-feet per year, depending on the method selected for showing depletions. 2 Rep. 323-324. He found similar problems with Kansas's calculation of depletions on a monthly basis. 2 Rep. 324.

"best estimate" that it could make (Kan. Br. 32) does not excuse its failure of proof.[13]

There is no merit to Kansas's specific contention that the Special Master improperly based his decision to reject its WWSP claim "on the proposition that if accretions were taken into account, then depletions would be essentially eliminated." Kan. Br. 33. The issue of accretions was simply one of the many problems that the Special Master identified in Kansas's proof. He correctly observed that factoring in projected WWSP accretions—by which he meant the increases in flow predicted by the Kansas model (2 Rep. 328)—would "essentially" eliminate Kansas's projected WWSP depletions. See 2 Rep. 327-329, 335. But that considera-

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[13] The Special Master rejected Kansas's argument that "[c]ommon sense leads to the conclusion" (Kan. Br. 27) that the WWSP causes Stateline depletions, recognizing that the "issue is much more complex than first appears." 2 Rep. 329. He also recognized that a number of other studies had reached conclusions contrary to those of Kansas. 2 Rep. 313-318. The Special Master discussed studies performed by the United States Geological Survey (USGS) for the period from 1967 to 1979 showing that the WWSP had not reduced in-flow to John Martin Reservoir. 2 Rep. 313. He also discussed a USGS computer model that studied the 1972 to 1974 period and predicted that a winter storage program would increase Stateline flows, 2 Rep. 313, and he cited a study by Kansas's own Division of Water Resources, which concluded there had not been a "reduced flow at the Las Animas gage . . . since operation of Pueblo Reservoir began." 2 Rep. 313. In addition, the Special Master rejected Kansas's contention that Colorado's model proved depletions. 2 Rep. 316, 318. The Special Master noted that Colorado's model indicated total depletions over a 27-year period, at an average of 354 acre-feet per year, but did not translate those depletions to reductions in usable flows. He also noted that Colorado's expert testified that the WWSP had resulted in "no discernible impact" on Stateline flows. 2 Rep. 316.

tion was not a significant basis for his decision. See 2 Rep. 314-335.

Furthermore, Kansas is wrong in suggesting that the Special Master treated the issue of accretions inconsistently in different parts of the case. See Kan. Br. 33-34. Kansas contends that because the Special Master did not take into account accretions in finding Colorado liable on Kansas's groundwater pumping claim, he should not have relied on accretions in rejecting Kansas's WWSP claim. There is, however, no inconsistency in the Special Master's rulings. The Special Master found that Kansas had proved liability with respect to groundwater pumping despite the problems he detected on the issue of accretions.[14] By contrast, the Special Master found that Kansas had failed to establish liability for the WWSP claim because of numerous problems in its proof, including Kansas's failure to account for the fact that the WWSP could actually increase the Stateline flows under certain conditions. 2 Rep. 327-329. The Special Master properly concluded that while further evidence on accretions would be needed to determine the specific remedy for Colorado's groundwater pumping violations, the failure of Kansas's evidence on the WWSP claim was so clear that the claim should be denied.

Kansas's general argument (Kan. Br. 34) that the Special Master failed to allow "full development" of the

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[14] The Special Master specifically stated that he had "no difficulty in concluding that postcompact pumping in Colorado has caused material depletions of the usable Stateline flows." 2 Rep. 263. He nevertheless concluded that the issue of accretions—which in that context referred to increases in Stateline flows resulting from stored water releases and groundwater pumping (2 Rep. 261)—"needs to be examined" to determine the proper remedy. 2 Rep. 263.

facts is entirely without merit. The Special Master gave Kansas every reasonable opportunity to prove its case. He continually allowed Kansas to change its exhibits and analysis during the course of the case, and he also permitted Kansas a recess lasting for a year to correct errors in its evidence and prepare new experts. See, *e.g.*, Rep. App. 82-95. Notwithstanding the Special Master's extraordinary forbearance, Kansas failed to meet its burden. The Special Master's rejection of Kansas's WWSP claim was correct in light of all of the defects he found in Kansas's presentation.

C. THE SPECIAL MASTER SELECTED AN APPROPRIATE METHOD FOR CALCULATING USABLE DEPLETIONS

Kansas also challenges the Special Master's method for calculating what portion of the depletions that Kansas has projected are in fact "usable" depletions. Kan. Br. 35-44. As we have explained, Article IV-D of the Arkansas River Compact prohibits material depletion of water "in usable quantity or availability for use to the water users in Colorado and Kansas." Rep. App. 5. Kansas was therefore obligated to prove that the depletions it alleged—whether based on Colorado's groundwater pumping or the WWSP—deprived Kansas of water at a time when the water could have been utilized by downstream users. See 2 Rep. 291-292. The Special Master considered the methods that Kansas had offered for estimating what portion of total depletions were usable depletions and selected the most appropriate method from among the available options. 2 Rep. 291-305. Kansas's objections to the Special Master's choice are unpersuasive.

Kansas presented three different estimation methods at trial. The first method, which was developed by the

original Kansas expert, Timothy Durbin, used the Kansas hydrologic model to calculate seasonal average flows, and then applied a percentage reduction, using coefficients based on Kansas's seasonal average historic diversions. 2 Rep. 293-294. On that basis, Durbin estimated that approximately "78% of the Stateline flows during the summer were diverted" and approximately "24% of the winter flow was diverted." 2 Rep. 293-294. The second approach, developed by a Kansas "replacement" expert, Stephen Larson, utilized the same basic methodology. Larson, however, made corrections to Durbin's calculations and "modified Durbin's coefficients, using 72% for the summer irrigation months and 25% for the winter months." 2 Rep. 294-296.

The third method, developed by another Kansas "replacement" expert, Brent Spronk, represented a sharp departure from the Durbin and Larson approaches. He did not rely on Kansas's average historic water use. Instead, Spronk attempted to determine the "percentage of days in each month when flows were being fully used in Kansas." 2 Rep. 301. He then utilized the Kansas hydrologic model to calculate "monthly outputs of changed Stateline flow" and applied his daily use estimates to the model's projections of monthly output. 2 Rep. 302. Spronk's approach does not provide seasonal averages, but instead estimates usable depletions on a monthly basis. Spronk's approach predicts an aggregate usable depletion of 489,000 acre-feet from groundwater pumping and the WWSP for the period from 1950 to 1985, while the Durbin analysis using the Larson coefficients predicts a usable depletion of 365,000 acre-feet for that period. 2 Rep. 303.

The Special Master properly concluded that the Durbin approach using the Larson coefficients was the

best of the three methods for calculating depletions to usable flow. He rejected the Spronk approach on the ground that it was incompatible with the Kansas hydrologic model. The Special Master explained that the Kansas hydrologic model was constructed on the basis of average data, 2 Rep. 302, 330 n.130, and it could not reliably predict "changes of Stateline flow on a monthly basis." 2 Rep. 303. Spronk's approach—which relied on the Kansas model to estimate total monthly flows—was therefore inherently unreliable. 2 Rep. 302 n.129, 303-304. The Special Master accordingly rejected the Spronk approach and instead selected a method that would be valid for use with the Kansas model projections. He properly concluded that the Durbin/Larson approach, though imperfect, was the most reasonable of the methods for computing usable depletions on the basis of the Kansas model. See 2 Rep. 305.[15]

Kansas contends that the method adopted by the Special Master is incompatible with the Compact, which, according to Kansas, "excludes the notion of averaging." Kan. Br. 28, 37-39. Kansas also relies on this Court's decision in *Colorado* v. *Kansas*, *supra*, which stated that "average annual flow[s]" are "not helpful in ascertaining the dependable supply of water usable for irrigation." 320 U.S. at 397. Those arguments, however, ignore the fact that Kansas itself has relied on average seasonal and annual flows in constructing its hydrologic model and that its model could not accurately predict "monthly" flows. See 2 Rep. 302-304 & n.130. Thus, if Kansas is correct that the Compact and this Court's decisions

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[15] The Special Master also considered Colorado's proposed method for calculating "usable" depletions, but he found it flawed in various respects. 2 Rep. 296-300.

prohibit the use of average flows, then the Special Master should have refused to rely on Kansas's model for any purpose and should have rejected Kansas's claims in their entirety.

The Special Master was willing to give credence to Kansas's hydrologic model with respect to Kansas's groundwater pumping claim, despite the model's many problems. See 2 Rep. 228-240. But he also recognized that any approach for determining usable depletions had to be consistent with the limitations of that model. The three approaches that Kansas proposed for calculating usable depletions all required two steps: (1) a calculation of total depletions, and (2) an application of "usability" criteria. 2 Rep. 302 n.129. All three methods also relied on the Kansas model to estimate total depletions. The Spronk approach, however, required the Kansas model to do something that it was not designed to do—namely, to predict accurately the total depletions on a monthly or daily basis. See 2 Rep. 303 & n.130. The Special Master correctly concluded that he could not rely on the Kansas model to obtain that information, and he therefore properly concluded that the Spronk method should not be used. 2 Rep. 303-305.

Kansas's contention that the Special Master rejected Spronk's approach based upon "unsubstantiated criticisms" is without merit. Kan. Br. 41-44. The Special Master made a reasonable choice based on the options that Kansas presented, and his choice is firmly grounded in the evidence produced at trial. The Special Master, who became intimately familiar with Kansas's modeling methodology over the course of the trial, see 2 Rep. 228-263, found that "virtually the entire [Kansas] model is based on average data." 2 Rep. 302. Kansas offers no reason to question that finding. Although the State

disputes the Special Master's conclusion that its hydrologic model is "based on average data," it immediately concedes in an accompanying footnote that "certain components of the Kansas model" are in fact "based on averages." Kan. Br. 41 & n.25.

The Special Master credited the testimony of the Kansas expert who designed the model, Durbin, who stated that, because of the nature of the data input and the assumptions used in its construction, the model's results were reliable only on a long-term average basis. 2 Rep. 303 n.130. The Special Master also credited the testimony of Colorado's and the United States' experts, who provided persuasive documentation that the Kansas model results "were not reliable on a monthly basis." 2 Rep. 303-304. Kansas does not challenge that testimony. Instead, Kansas simply falls back on its argument that "Colorado, not Kansas, should bear the risk of the lack of adequate (non-average) data." Kan. Br. 42.

Notwithstanding Kansas's protestations, the Special Master articulated a sound basis for concluding that Spronk's approach to calculating usable depletions was flawed. The fact that the Spronk approach sometimes coincides with the Durbin/Larson approach (Kan. Br. 44) provides no basis for utilizing it. Indeed, the Special Master's finding of liability demonstrates that Kansas did not need to rely on the Spronk approach to prove that Colorado was liable on the groundwater pumping claim, and that approach does not promise a more accurate answer to the primary issue in developing a remedy—namely, the full measure of Colorado's aggregate depletions over the time period in question. The Court should accordingly accept the Special Master method for calculating usable depletions.

D. THE COURT SHOULD APPLY THE PRINCIPLES ESTABLISHED IN ITS EQUITABLE APPORTIONMENT CASES TO THE STANDARD OF PROOF AND LACHES ISSUES IN THIS CASE

Colorado has also filed a series of exceptions to the recommendations of the Special Master. Those exceptions pertain primarily to the dispute between Kansas and Colorado over Colorado's post-Compact groundwater pumping. The United States did not participate in the proceedings on the groundwater pumping issue, and we accordingly take no position on the specific merits of Colorado's exceptions. Nevertheless, we offer some general observations about the pertinent law. In our view, the legal principles that this Court has developed in the context of equitable apportionment actions provide guidance for the resolution of Colorado's claims involving the appropriate standard of proof and the application of equitable doctrines, such as laches.

This Court recently reiterated its longstanding rule in original actions that a State may obtain a decree against another State to apportion an interstate stream, or to modify a prior apportionment, only upon "proof 'by clear and convincing evidence' of 'some real and substantial injury or damage.'" *Nebraska* v. *Wyoming*, 113 S. Ct. 1689, 1695 (1993). See, *e.g.*, *Idaho ex rel. Evans* v. *Oregon*, 462 U.S. 1017, 1027 (1983); *Colorado* v. *New Mexico*, 459 U.S. 176, 187 n.13 (1982). The Court made clear, however, that if the State seeks only to enforce an existing apportionment, "the plaintiff need not show injury" (beyond a violation of the decree itself) because the decree establishes the plaintiff's right to relief. *Nebraska* v. *Wyoming*, 113 S. Ct. at 1695. See *Wyoming* v. *Colorado*, 309 U.S. 572, 581 (1940). The Court did not explicitly answer the question, however, of what

standard of proof would apply to factual disputes in a State's action to enforce a prior decree. The Court had no need to resolve that matter because the enforcement issue decided in that case, which was before the Court on motions for summary judgment, did not involve an issue of disputed material fact. See *Nebraska* v. *Wyoming*, 113 S. Ct. at 1695-1697.

This Court has left no doubt that the "clear-and-convincing" evidentiary standard applies when a State seeks to establish an equitable apportionment or to modify it in a way that would disturb the status quo, either by enjoining an existing use or by allowing a proposed diversion. See *Nebraska* v. *Wyoming*, 113 S. Ct. at 1695; *Colorado* v. *New Mexico*, 467 U.S. 310, 315-317 (1984); *Colorado* v. *New Mexico*, 459 U.S. 467 U.S. at 187 n.13. The Court explained that a "standard of proof allocates the risk of erroneous judgment between the litigants and indicates the relative importance society attaches to the ultimate decision." *Colorado* v. *New Mexico*, 467 U.S. at 315-316. It reasoned that, in the equitable apportionment context, the "clear-and-convincing" standard "is necessary to appropriately balance the unique interests involved in water rights disputes between sovereigns." *Id.* at 316. The Court further explained that the heightened standard "accommodates society's competing interests in increasing the stability of property rights and in putting resources to their most efficient uses" and reduces the risk of an erroneous decision "disrupting established uses." *Id.* at 316. See also *id.* at 320-321 ("Society's interest in minimizing erroneous decisions in equitable apportionment cases requires that hard facts, not suppositions or opinions, be the basis for interstate diversions."); *Connecticut* v. *Massachusetts*, 282 U.S. 660, 669 (1931) ("this Court will

not exert its extraordinary power to control the conduct of one State at the suit of another, unless the threatened invasion of rights is of serious magnitude and established by clear and convincing evidence").

Many of the reasons for applying the "clear and convincing" standard to actions for entry or modification of an interstate apportionment decree will also ordinarly be present in actions to enforce a decree. An enforcement action will involve the same "sovereign" States that are subject to the decree, and, if successful, will typically result in further relief. To be sure, as this Court explained in *Nebraska* v. *Wyoming*, *supra*, the State in an enforcement action does not need to show "injury" to justify relief, and may instead rely on the rights established by the decree. 113 S. Ct. at 1695. Thus, there often may be no significant factual issue to be resolved in an enforcement action. But when there is a factual issue to be resolved, the consequences of the resulting factual findings are much the same as in an initial apportionment action—the findings will potentially result in an injunction that upsets the status quo, by either allowing a proposed water use or enjoining an existing one. Society has a strong interest in "minimizing erroneous decisions" on such issues. *Colorado* v. *New Mexico*, 467 U.S. at 320-321.

Similar considerations suggest that the "clear and convincing" standard of proof should apply in this compact enforcement action. An interstate compact imposes limitations on sovereign States with respect to the use of a shared water resource. Furthermore, a compact enforcement action will often raise the concerns the Court has expressed about the need for correct factfinding. This case demonstrates that point. As we have explained, the Arkansas River Compact prohibits

the States from "materially depleting" available water, and hence an enforcement action under that Compact will usually depend on whether that prohibition was in fact violated. As the Special Master's report shows, that factual question can be technically complex, and an affirmative answer may have grave consequences for the offending State. In this context, the answer should be based on "hard facts, not suppositions or opinions." *Colorado* v. *New Mexico*, 467 U.S. at 320-321. Cf. *Alabama* v. *Arizona*, 291 U.S. 286, 292 (1934); *Connecticut* v. *Massachusetts*, 282 U.S. at 669.[16]

On the question of laches, we agree with Colorado and the Special Master that this Court may take into account traditional equitable principles, such as the doctrine of laches, when resolving an equitable claim by one State against another State in an original action. For example, in *Nebraska* v. *Wyoming*, *supra*, this Court resolved a dispute between two States over the priority date of a water storage facility by relying in part on a rationale akin to the doctrine of laches. The Court stated:

> We think the evidence from the prior [equitable apportionment] litigation supports the conclusion that the Inland Lakes' priority was settled there. And even if the issue was not previously determined,

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[16] In this case, the Special Master elected to apply a preponderance of the evidence standard. See 1 Rep. 65-70. Nevertheless, the application of a heightened standard would not necessarily change the outcome in this case. The Special Master concluded under the preponderance standard that Kansas had proved only its ground water pumping claim, and with respect to that claim he determined that Colorado's groundwater pumping violated the Compact regardless of the standard of proof applied. 2 Rep. 263.

> we would agree with the Special Master that Wyoming's arguments are foreclosed by its postdecree acquiescence.

113 S. Ct. at 1697 (citing *Ohio* v. *Kentucky*, 410 U.S. 641, 648 (1973)). See also *Colorado* v. *Kansas*, 320 U.S. at 394. Concepts such as laches or acquiescence are applicable to actions to enforce a compact insofar as enforcement turns on equitable principles. Cf. *Texas* v. *New Mexico*, 482 U.S. 124 (1987) (enforcing a compact through the use of equitable remedies). The fact that an equitable doctrine, such as laches, may be invoked by one State against another does not, of course, answer the question whether Colorado has made out the defense of laches on the facts of this case. See 1 Rep. 147-170.

CONCLUSION

The exceptions of Kansas to the Report of the Special Master should be overruled.

Respectfully submitted.

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